

4. That the Holtwood Substation and the Highlandtown Substation would be replaced with modern substitutes and located at the same sites.

5. That all the other properties of the Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland would be reproduced exactly as they now exist which includes land and land rights, roads, railroads, trails, the Holtwood Village, the transmission lines other than the 25 cycle Holtwood to Highlandtown lines, and the substations other than Holtwood and Highlandtown, together with all other general plant.

6. That the costs shown in this study for the identical items replaced as referred to in paragraph 5 above, were [781] obtained from company Exhibit 31, entitled "Cost of Constructing and Reproducing the Entire Physical Property of the Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland as of December 31, 1945."

7. That as to the items which are not identically reproduced, the new structures, equipment, and so forth, would be those used in a modern plant constructed today at the same location in a plant of like capacity and capable of performing the same functions that the companies' present plant now performs.

8. That substantially the same construction period as was encountered in the construction of Safe Harbor and other similar large projects was used in reproducing the substitute plant.

9. That average climatic and river flow conditions prevail.

10. That the modern construction methods, facilities, and procedure that were actually used in the original construction of Safe Harbor and other large

projects would be repeated in reproducing the substituted portions of the companies' plant.

11. That wages and material prices would remain as they were on December 31, 1945, throughout the entire reproduction period.

12. That sufficient labor would be available at the [782] prevailing wage rates used to reproduce the properties.

13. That sufficient materials and equipment would be available at present published and quoted prices within prevailing OPA and other governmental regulations.

Exhibit No. 32 and the testimony of Mr. Hall in support thereof are offered for the following purposes:

1. As a basis for determining the extent of the justification for the replacement of property, for determining the proper accruals for the depreciation in the property so that the original investment of the owners in property will remain unimpaired.

2. To be used in connection with determining the rate of return appropriately applicable to whatever rate base or bases the Commission may determine, so as to test the propriety and reasonableness of the rate of return and the return allowance by comparison with the returns currently available to other and competitive enterprises of corresponding risk and uncertainty.

3. To be considered and weighed by the Commission in determining the reasonableness of any of the rates, charges or classifications of Respondents as may be subject to the jurisdiction, if any, of the Commission, by determining the fair value of the properties of Respondents used and useful in the rendering of the particular service for which such rates, charges and classifications are demanded, observed, charged [783]

or collected, and by determining the fair return allowable on such fair value.

I understand, if your Honor please, that your Honor rules that Exhibit 32 marked for Identification and the testimony of Mr. Hall with regard to that exhibit are not to be admitted?

TRIAL EXAMINER: May I see counsel's statement as he read it?

MR. SPARKS: Yes, sir. (Handing paper to Trial Examiner.)

TRIAL EXAMINER: Exhibit 32 for Identification will not be received in evidence and the testimony of the witness Hall likewise will be excluded in so far as the testimony has been described in counsel's offer of proof.

MR. SPARKS: May I ask whether your Honor rules that if the testimony of Mr. Hall be not fully described in the proffer such as that if I say that all of Mr. Hall's testimony which he would give would relate to Exhibit 32, that that testimony would likewise be excluded?

TRIAL EXAMINER: Yes.

MR. SPARKS: I take an exception.

[795] TRIAL EXAMINER: The Examiner will not receive the testimony to which counsel has referred.

MR. SPARKS: Very well, sir. We take an exception to the Examiner's ruling excluding the evidence, and I will make an offer of proof.

We offer the testimony of Roland L. Bortner, assistant secretary and right-of-way engineer for the Pennsylvania Water & Power Company, as follows: That Mr. Bortner is a graduate of the Baltimore Polytechnic Institute, has attended Pennsylvania State College and Johns Hopkins University, that he has

had experience in purchasing and valuing rights-of-way since 1923. Between June, 1919, and 1920 he held positions connected with land and right-of-way surveys with the Baltimore & Ohio Railroad and the City of Baltimore. He has had experience in the valuation of land and land rights since 1923 with the Pennsylvania Water & Power Company. He cooperated with the War Department in the acquisition of a right-of-way between Gunpowder and Magnolia, Edgewood Arsenal, and in the last five years has done considerable work for the Consolidated Gas Electric Light & Power Company of Baltimore in connection with the acquisition of rights of way in [796] Baltimore County, Maryland. That he made appraisals of the fair market value of the land and land rights of the Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland as of December 31, 1945, covering transmission line rights-of-way and substation or terminal sites listed in Account 340 used by the witness Tate in his reproduction study, Exhibit 31, and testimony, in the amount of \$4,027,220, and used by the witness Hall in his substitute plant study, Exhibit 32, and testimony, in the amount of \$4,080,689.

The testimony of the witness Bortner is offered as evidence of the fair value of land and land rights of the Respondents carried in Account 340 for rate base purposes and for any other appropriate purpose.

And I understand that your Honor's ruling is that such testimony would not be admitted?

TRIAL EXAMINER: That is correct.

[797] TRIAL EXAMINER: The hearing will be in order.

Whereupon

HERBERT B. DORAU,

a witness produced on behalf of the Respondents, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By **MR. HULL:**

Q. Please state your name, address and occupation.

A. My name is Herbert B. Dorau, I reside at 268 Mountain Avenue, Ridgewood, New Jersey. I am a professor of Economics in New York University; chairman of the Department of Public Utilities and Transportation in the School of Commerce of New York University, and professor in the Graduate School of Business of New York University. I have been a consulting economist for more than twenty years.

Q. Will you summarize your education and professional training? A. I was graduated from Lawrence College, Appleton, Wisconsin, in 1919 with an A. B. degree. After one year of graduate study in economics at the University of Wisconsin I was granted an M. A. degree. I continued graduate study at the University of Wisconsin in the field of public utilities and transportation while serving as an instructor. The University of Wisconsin granted the Ph. D. degree in 1928.

[798] During the years 1920-1925 I was an instructor at the University of Wisconsin teaching courses in economics, transportation, money and banking and corporation finance.

In 1925 I accepted appointment as assistant professor of Economics in charge of instruction in public utilities at Northwestern University School of Commerce.

In 1928 I became associate professor. In 1929 Northwestern University granted me a year's leave of absence during which time I engaged in economic and financial consulting work in New York. My leave of absence was extended for a second year during which year I was a lecturer

in Public Utilities in New York University while engaging in financial consulting work.

Since 1932 I have been on the faculty of New York University, as associate professor of Economics to 1936 and as professor of Economics since that time.

During the years 1921 to 1929 I was successively research assistant, research instructor and research associate in the Intitute for Economic Research, engaging in and directing economic research in the fields of public utilities and urban land economics.

I am the author of the following books and articles—and I will be glad to shorten the proceedings and offer this for the record if you so desire.

[799] TRIAL EXAMINER: You may do so, and the reporter will incorporate it into the record at this point.

(The books and articles referred to are as follows:)

Books

- "The Changing Character and Extent of Public Ownership in the Electric Light and Power Industry;"
- "Urban Land Economics" (with A. G. Hinman);
- "Materials for the Study of Public Utility Economics"; joint author;
- "Economic Principles and Problems;"
- "Planned Society, Yesterday, Today and Tomorrow;"
- "Real Estate Merchandising."

Articles and Research Reports

- "Public Utility Financing, 1919-1925." Journal of Land and Public Utility Economics, July, 1925.
- "Public Utility Financing, a Review of 1925." Journal of Land and Public Utility Economics, April, 1926.
- "The Cost of Railway Capital Under the Transportation Act of 1920." American Economic Review—March, 1927. Journal of Land and Public Utility Economics, February, 1927.

"The Rise and Decline of Municipal Ownership in the Electric Light and Power Industry of Wisconsin." *Journal of Land and Public Utility Economics*, May, 1927.

[800] "Municipal Ownership in the Electric Light and Power Industry of Massachusetts." *Journal of Land and Public Utility Economics*, August, 1927.

"Some Measures and Measurements of Telephone Utility Taxation." *Journal of Land and Public Utility Economics*, November, 1927 (co-author).

"Gross and Net Earnings of Public Utility Enterprises Exclusive of Steam Railway, Telephone and Telegraph Utilities, 1913-1926." *Journal of Land and Public Utility Economics*, February, 1928.

"Appliance Merchandising Policies and the Future of Gas—Should the Gas Company Set the Standard for Appliance Selling in the Territory Served with Its Products?" *Gas Age Record*, March 3, 10, and 17, 1928.

"Cost of Railway Capital." *Journal of Land and Public Utility Economics*, May and November, 1928.

"The New Competition—How to Meet It." *American Gas Association Monthly*, December, 1928.

"Cost of Railway Capital." *Journal of Land and Public Utility Economics*, May, 1928.

"Railroads' Command of Capital." *Investment Banking*, August, 1931.

Some Economic Considerations Bearing on the Place and Significance of the Holding Company in the Organization and Functioning of the Public Utility Industries, Submitted to the Committee on Interstate Commerce of the United States Senate, May 1, 1935. pp. 24.

"Some Alternative Bases for Public Power Projects." *The Southern Economic Journal*, April, 1938.

[801] "Dispersion of Prices for Domestic Electric Service." *Public Utilities Fortnightly*, June 9, 1938.

"Rates in the Electric Industry Under Municipal Ownership." *Annals of the American Academy of Political and Social Science*, January, 1939.

"The Impact of Economics on Accounting." *Edison Electric Institute Bulletin*, January, 1939.

"The Outlook for Public Utilities." *Trusts and Estates*, January and February, 1939.

"Public Utilities Accounting." *The New York Certified Public Accountant*, May, 1941.

"Economic Implications of Public Utility Depreciation Accounting." *The New York Certified Public Accountant*, June, 1944.

"Socialized Transport and the Future of Enterprise." *Railway Age*, June, 1944.

By MR. HULL:

Q. Will you state in somewhat greater detail the character and range of your professional work as an economist?

A. My first employment in an economic capacity was for the Public Utilities Acquisition Committee of the Common Council of the City of Milwaukee during 1920, to determine the probable cost of capital for municipal utility acquisition purposes.

[802] This involved a study of the comparative cost of public utility capital and was my initial study of the problem of the cost of money to public utilities. I have since engaged, in so far as my university obligations would permit, in a wide range of economic, financial, accounting and statistical studies concerned with public utility industries and others.

From 1936 to 1938 I made an extensive analysis of the reports of the F. T. C. investigation of utility accounting and financial practices, during 1939 and 1940 I made an extensive statistical analysis on a nationwide basis of comparative electric rate levels and factors influencing rate levels. During the years 1928 to 1932 I had extensive experience in the field of investment analysis and some experience in the financing of public utility enterprises.

I have from time to time acted as consultant to the New Jersey Board of Public Utility Commissioners and served on the Port Protection Committee of the New York Port Authority; during 1930 to 1931 I was a member of the President's Committee on Housing and Home Ownership.

I have appeared in a professional and expert capacity before the Public Utility Commissions of the States of Illinois, Pennsylvania, Indiana and New York; before the Securities and Exchange Commission, the Interstate Commerce Commission, and the Federal Power Commission in cases involving the rate of return, depreciation and accounting matters.

[803] I have appeared, by invitation, before professional societies and industrial association meetings such as the American Economic Association, the American Gas Association, and the National Accounting Conferences of the electric and gas utility industries. I originated and for a number of years made the periodic analyses of utility financing published by the Journal of Land and Public Utility Economics.

Q. Have you prepared an exhibit setting forth the changes in the supply of money in the United States over the period 1914-1946? A. I have prepared a tabulation and charts setting forth deposits, investments and loans of all banks as well as currency in circulation and gold stocks in millions of dollars for the period 1914-1946, yes, sir.

[804] Q. Will you briefly explain the meaning and significance of this exhibit?

. . .

[807] A. Very well. The chart in this exhibit graphically sets forth the rise in total bank deposits, gold stocks and currency in circulation, 1914-1945, and the rise of loans from 1914 to 1929 and the subsequent decline of loans. It can be readily and quickly seen that total deposits have gone through two periods of substantial increase since 1933. The first rise took place from 1933 to 1943, during

which period total deposits rose from \$36,919 million to \$71,027 million. The second and even more rapid rise brought the total of the June 30, 1942, of \$71,027 million to \$137,688 million as of June 30, 1945.

[810] MR. HULL: Mr. Examiner, I would like to have marked for identification as Exhibit No. 33 a document bearing this title:

"Before the Federal Power Commission—In the matter of Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland, IT-5915—Testimony and Exhibits of Dr. H. B. Dorau relating to the Supply of Money and the Value of the Dollar."

[812] Q. Dr. Dorau, do you have before you a copy of the exhibit which I have just described and which has been marked for identification as Exhibit No. 33? A. I have.

Q. Will you state whether or not you prepared the explanatory matter preceding the charts in this exhibit? A. I did.

Q. And the charts were prepared under your supervision? A. They were.

Q. Doctor, what is the meaning and significance of total deposits in dollars? A. Total deposits in dollars measure the quantity of dollar money which the banks owe the depositors and which the depositors can withdraw from the banks and spend as they may choose, time deposits with notice, other deposits on demand. Total deposits measure the potential expressible money spending power of depositors. Deposit dollars are money and thus a major part of the money supply of the country. [813] The increase in deposits therefore measures, to a large extent, the increase in the supply of money in the United States.

Q. Are there other components of the money supply? A. Yes, currency in circulation.

Q. Will you explain your exhibit in further detail?

A. With respect to currency in circulation, reference to the chart indicates a gradual increase until 1939 when a rapid rise began. From a level of \$6,461 million as of June 30, 1938, the currency in circulation rose to \$9,612 million in 1941 to \$17,421 million in 1943 and to \$26,746 million in 1945.

As of June 30, 1945, currency in circulation was more than eight times the amount of June 30, 1914, and more than four times the quantity as of June 30, 1938.

Gold stocks, because they are at least in theory the basis of our monetary standard of value, are also important. The gold stock of the country has increased from \$1,699 million as of June 30, 1915, to \$20,213 million as of 1945. The rapid increase in gold stock took place after 1933, since which date the rise has been five-fold.

In 1933 the total of deposit money and currency in circulation was \$42,353 million; in 1945 the total of deposit money and currency was \$164,667 million, or close to a four-fold increase.

[814] The difference between total deposits and loans is also important. Loans represent the extent to which people are in debt to the banks as distinguished from deposits which reflect the extent to which banks are in debt to their depositors.

As of June 30, 1919, following the last previous war, the excess of deposits over loans may be seen by reference to the tabulation which is a part of this exhibit, to have been only \$7,322 million—\$32,012 million less \$24,690 million.

As of June 30, 1945, the excess of deposits over loans was \$109,709 million, or fifteen times the excess of deposits over loans in 1919.

Q. What is the economic significance of this substantial increase in the quantity of money for the determination of a fair return in utility regulation? A. The money revolution in the United States since 1933 constitutes the

largest monetary inflation in the history of the country. The increase in the number of dollars of money in the country since 1933, and even more strikingly since 1941, is without parallel and unprecedented in this country.

The dollar is the economic measure of investment and return, of sacrifice and income. The quantity of dollars is therefore one of the important factors determining the size of the dollar as a unit for the measurement of [815] economic sacrifice and return.

The yardstick as a linear measure does not change in linear significance when the number of yardsticks is increased, but the size of the dollar as a standard of measurement tends to decrease with an increase in the effective quantity of spendable dollars.

A change in the magnitude of any unit of measurement and enumeration destroys its validity as a standard of measurement and comparison.

Merely calling the changed unit of measurement by the same name does not make it the same. The summation of such changed units of measurement, simply because they continue to have the same label, is as invalid as adding pears, peaches, peas and persimmons. The accounting summation of unlike dollars does not measure the investment sacrifice.

If the mile as a unit of linear measurement should have changed in magnitude as the dollar has changed as a measure of sacrifice and gain, no sensible person would draw any conclusions from a comparison of ton-miles of railway service in 1907, 1917 and 1935. Before any informed person would believe that the ton-miles in 1917 exceeded the ton-miles in 1935, he would demand that such calculations be translated into an equated or equivalent number of ton-miles on the basis of the relative magnitude of the different length of the miles used.

[816] Progress in every field of human endeavor has depended on the establishment of standard and comparable units of measurement. When the horsepower was the

power of a horse instead of the energy equivalent of 550 foot-pounds per second, the enumeration of horsepowers was of limited accuracy and meaning.

When the foot was literally a "foot-length" instead of, as now 12 inches, linear measurement and comparison were uncertain and unreliable. It would be no more inappropriate to add nautical miles and land miles than to add 1907 dollars and 1917 dollars, but no respectable geographer would do so.

If the mile as well as the dollar has been redefined at 59 per cent of its former magnitude in 1934, geographers and engineers would not make comparisons and enumeration without equating and adjusting for the difference in the actual comparative magnitude of the standard of measurement.

Q. Can the differences in the dollar as a unit of measurement of economic cost and income be equated so as to afford a reasonably comparable standard for the measurement of investment and return in utility regulation? A.

Yes, the variability of the dollar as a unit of economic measurement can be measured with reasonable accuracy so as to afford the basis for equating one size dollar with another. The size of the dollar is measured by the goods and services which it can buy. Money is but the medium of exchange [817] and the dollar is the unit of measurement, but the dollar varies in its purchasing power, its exchangeability for goods and services, and thus in its size.

This variability of the dollar can be equated so that the dollars of different size can be legitimately added and expressed as the equivalent of a fixed and certain sum of any other size of dollar, just as the sum of nautical and land miles can be equated and expressed as either so many nautical miles or the equated number of land miles.

Q. Have you prepared an exhibit which sets forth the change in the yearly average size of the dollar over the period 1902-1945? A. Yes, I have prepared a tabulation which sets forth the purchasing power change in the size

of the dollar by years from 1902 to 1945 and a seven-year moving average from 1905.

Column 1 identifies the years from 1902 to 1945.

Column 2 records the wholesale price index as reported by the United States Department of Labor, Bureau of Labor Statistics, with the average for 1926 equal to an index of 100.

Column 3 translates the index of wholesale prices into the purchasing power of the dollar which is determined by calculating the reciprocal of the annual averages in Column 2, i. e., by dividing the index of wholesale prices [818] into 100.

Column 4 records the total of the seven years of Column 3; i. e., the total of the years 1902-1908 for 1905, and for each succeeding seven-year group in the same way down to 1943, for which a five-year total is ascertained, and for 1944 for which year a three-year total is determined, and for 1945, for which a one-year total is taken.

Column 5 records the calculated seven-year moving average of Column 3 plotted on the fourth year center, except that for the year 1943 a five-year average is calculated and recorded, for 1944 a three-year average, and for 1945 a one-year average.

Column 6 records the translation of the seven-year moving average index of the purchasing power of the dollar to an index with 1945 as 100 for ease of comparison.

Q. Does the United States Department of Commerce calculate and report the changing purchasing power of the dollar? A. Yes, in the Survey of Current Business.

Q. Does it use the same index of wholesale prices which you have used? A. Yes, the Department of Commerce calculates the purchasing power of the dollar as the reciprocal of the index of wholesale prices.

Q. Why did you use a seven-year moving average, [819] except as noted? A. The period of time from 1902 to 1945 is long enough to accommodate a seven-year average and a seven-year average satisfactorily eliminates

minor and short-term changes which are more in the nature of fluctuations.

Q. Why did you use a five and three-year average for 1943 and 1944 and the one-year average for 1945? A. In order to taper off the seven-year average and bring it down to the current time and date of 1945. This is satisfactory and justified since the trend during these years was in the same direction and accelerating. Moreover, since the continuing trend in 1945 and 1946 is strongly in the direction of higher prices and a cheaper dollar, the result is conservative.

Q. What, in brief, does the index developed, in Column 6 of this exhibit, disclose as to the changing economic size of the dollar? A. Treating the 1945 dollar as 100, or par, the dollar of 1905 was 73.2 per cent larger. The average size of the dollar was larger than in 1945 in every year down to 1918. From 1918 to 1923 it was slightly and temporarily below 100, but since 1922 the purchasing power of the dollar has been above 1945 by as much as 42.3 per cent in 1934 and on the average for the period 23 per cent above 1945.

[820] From 1905 to 1918 the purchasing power of the dollar was on the average 50 per cent above 1945.

From 1918 to 1923 it was on the average 5 per cent below 1945.

For the entire period 1905-1945, the average purchasing power of the dollar on the basis calculated in column 6, was 28 per cent above 1945.

Q. Do you find in these evidences of the changing magnitude of the dollar any basis for the conclusion that the changes in the economic size of the dollar can be disregarded because the fluctuations are compensatory? A. No. There is no evidence to support such an assertion in this exhibit or, in my opinion, anywhere. I have just pointed out that the average of the entire period is 28 per cent above 1945 and that in every year except five during a 44-year period the purchasing power of the dollar was

above 1945. My use of a seven-year moving average is proper treatment of mere fluctuations in the short term, and even if in the long term there were compensations, changing investments and investors would make the assumption of a constant dollar inequitable.

The long term trend, however, is not and has not been compensatory. The price level has been rising since 1897 and the dollar reciprocally declining in size. The trend continues.

[821] Forces and factors justifying the expectation that the dollar will continue to shrink in size are clearly in evidence. Among the more obvious of these factors are the unparalleled quantity of money, the rate of spending, the size of the public debt, and the new and high levels of wages.

Q. Has the dollar been legally re-defined during the period covered by your exhibit? A. Yes, before January 31, 1934 the "dollar" was the name for 23.22 grains of fine gold; after January 31, 1934 the name "dollar" was used to mean 13.714 grains of fine gold. The legal post-1934 dollar is only 59 per cent the size of the pre-1934 dollar. The dollar has been changed legally as well as economically, but the name remains the same, and so book-keepers add and subtract these different dollars without distinction.

Q. Has the distinction between the calculation of economic sacrifice and return in nominal and actually comparable dollars been recognized in other economic areas?

A. Yes. In the field of wage determination and administration the distinction between nominal dollar wages and real wages is fully recognized and well understood by wage earners and others.

Q. What is the economic meaning of the term investment? A. The investment process consists of converting liquid [822] or alternatively applicable economic resources into direct goods capable of income production. Invest-

ment involves the sacrifice of alternative goods and the alternative goods given up measure the investment made.

An investment may be made through the medium of money—as is most common in our day—or by direct investment of labor, risk-taking and the cost of waiting or postponement of income to the future. The investment in any economic undertaking may and commonly does consist of both money investment and direct investment. In any case the investment is measured by the sacrifice made to produce a future income, whether accounted for by bookkeeping or not, and whether in the form of money expenditures or direct sacrifices made without the intervention of the medium of exchange money.

Q. Assuming the entire investment of two enterprises to be reflected by the same number of accounted-for dollars, does it follow that the investment in the two enterprises is the same? A. No, it is the same only in the number of nominal dollars. If those dollars are not of equal size and economic significance, the investment sacrifice is not the same. If one was in 1918 dollars and the other in 1905 dollars, the actual investment would—as measured by the index of dollar purchasing power in Column 6 of my exhibit—be 73 per cent greater in 1905 dollars than the investment [823] of the same number of accounted-for 1918 dollars.

A larger number of small dollars may actually constitute a smaller investment than a smaller number of larger dollars.

Q. What is the economic meaning of the investment standard for utility rate-making? A. The investment standard proposes that the investor receive a fair return on the dollars—or dollar equivalent—which he gave up and invested, i. e.; on the sacrifice which he made. It is a sacrifice standard as distinguished from a value standard and cannot be fairly construed to mean the sacrifice of an equal number of other dollars since they would not measure the investment sacrifice made.

Q. Does the sum of the nominal dollars invested—in money and/or goods and services—measure the investment actually made if made in dollars of different economic size and purchasing power? A. Obviously not. An investment made by the sacrifice of dollars having a purchasing power of 100 would be equal to the investment of twice the same number of 50-cent dollars. It seems almost too simple to have to explain that an investment sacrifice of 1,000,000 hundred-cent dollars is the same as an investment of 2,000,000 fifty-cent dollars.

[828] MR. GOLDBERG: Let us put it this way: The prices of the very informed investor and the informed investor will both reflect in varying degrees the purchasing power of the dollar; is that not so?

THE WITNESS: I think as a general thing, that is satisfactory, yes.

By MR. HULL:

Q. Is it possible to express the nominal investment in an enterprise made in various kinds of dollars in terms of an equivalent number of dollars of equal size and equal investment significance? [829] A. Yes, very easily. The relative size and investment significance of the dollars sacrificed each year can be determined by reference to an index of purchasing power. By weighting the dollars invested each year by their purchasing power an average purchasing power dollar related to any desired base can be obtained and the investment in terms of any weight of dollar determined. In this way the constant dollar equivalent of the investment of heterogeneous dollars of different vintage and size can be determined.

Q. Have you applied this method to the dollars invested in electric plant in service of Pennsylvania Water & Power Company including Susquehanna Transmission Company to determine the investment sacrifice of 1945 dol-

lars? A. Yes, I requested that the company provide me with a distribution of the \$36,414,232 of electric plant in service, before adjustments and construction work in progress and property held for future use, by years according to year of origin of the dollars of electric plant in service December 31, 1945.

The Company provided the desired information and I have used the same in the first numerical column of a two-page tabulation and chart which I have prepared.

Q. Will you explain this tabulation and chart?

MR. GOLDBERG: Mr. Examiner, I think it is appropriate for me to make an objection to that question. That question [830] now brings us to the application of the testimony we have here to the actual cost of Pennsylvania Water & Power Company properties and the Susquehanna Transmission Company properties as claimed by those companies. The result, Mr. Examiner, is not the actual cost base or price. And this brings into the record elements which the Commission has rejected, and which the courts have sustained in reviewing the Commission's rejection.

I submit, Mr. Examiner, that it does not alter the situation any to protest that the translation of the actual investment by application of the current purchasing power of the dollar does not represent the result which can be termed reproduction cost, or trended original cost, or any other name that you may care to apply. The fact still remains that it is not actual cost, which is the only type of evidence the Commission has signified it is willing to receive. The fact that it is not actual cost, Mr. Examiner, I submit is fairly evident by the earlier answer of the witness when he stated:

"The investment standard proposes that the investor receive a fair return on the dollars, or dollar equivalent, which he gave up and invested,

that is to say, on the total sacrifice made. It is a sacrifice standard as distinguished from a value standard and cannot be fairly construed to mean the sacrifice of an equal number of other dollars since they would not measure the [831] investment sacrifice made."

In other words, Mr. Examiner, the translation that the witness comes up with in his exhibit and testimony, certainly that is not the actual cost of the properties of the Respondent companies.

TRIAL EXAMINER: Does counsel for the Respondents desire to reply?

MR. HULL: Yes, Mr. Examiner.

First, the Respondents believe that the exhibit and testimony of Dr. Dorau show very much more clearly than anything else could show what was the actual cost of the present property of the Respondent company.

It is a study which has not been, to our knowledge, ruled upon by this Commission as to its relevancy or admissibility, or by any court in the land.

A similar study was presented to the Examiner in the Safe Harbor Case, which case is now before the Commission for determination. After having been offered there and considered by the Examiner for some days, he ruled that it should be admitted because it was the type of study which had not theretofore been passed upon by the Commission.

MR. GOLDBERG: Mr. Examiner, may I bring counsel for Respondents down to date?

A somewhat similar study expressing alleged cost of these items in terms of valuations of the current purchasing power [832] of the dollar, was presented in the *City of Pittsburgh v. Pittsburgh and West Virginia Gas Company* and others, and in the matter of *Pittsburgh and West Virginia Gas Company and Kentucky*.

West Virginia Gas Company cases, Dockets G-627 and G-635 before Trial Examiner Marsh, who was the sitting Examiner in those cases.

On objection by counsel for the Staff—and it so happens, Mr. Examiner, that I am Counsel in those cases also—the Examiner excluded such evidence on the grounds that it no longer was evidence of actual cost, which was the only character of evidence that the Examiner would receive, in the light of the Commission's decision.

While it is true, Mr. Examiner, that the presiding Examiner in the Safe Harbor Case received the evidence, it is obvious from his careful consideration of the evidence, the very considerable misgivings he had in regards to its reception, and I submit that an examination of this case clearly discloses, and it is all laid out in the brief of that case, Mr. Examiner, that such evidence would not be admissible, and I am certain that the Commission will so hold when it considers the case.

I further submit, Mr. Examiner, that we are now arguing upon a question which has already been ruled upon by the Examiner in the excluding of IV-A of Schedule 31, I believe, or perhaps 32.

[833] **TRIAL EXAMINER:** Do the other counsel desire to be heard, counsel for the interveners?

(There was no response.)

MR. HULL: Mr. Examiner, might I make this suggestion: The testimony which Dr. Dorau has prepared explanatory of this exhibit, of it we have now heard 12 pages, and four and a half pages remain. I suggest that we hear the remainder of the testimony before your Honor makes his ruling.

TRIAL EXAMINER: Data contained on the schedule and chart now under discussion relating to the original

investment in electric plant in 1945 dollars will be excluded.

MR. HULL: I apologize for my lack of familiarity with the procedure in this form. Do I understand that I shall proceed with the questions and answers, and then make a further offer, or should I now make the offer? Is now the time to make the offer?

TRIAL EXAMINER: That is a matter in counsel's discretion. You can advise the Examiner of what you intend to offer in evidence from this point on, and the Examiner will indicate whether he will or not accept it.

MR. HULL: I do not know how I can advise you without [834] reading the testimony.

TRIAL EXAMINER: The Examiner will not receive any testimony or evidence going to the original investment in electric plant in terms of 1945 dollars.

MR. HULL: Your Honor, I do not understand. I have tried to make it clear that this is not the only purpose for which this witness is presented. This witness is also being presented for his evidence and testimony bearing upon the rate of return.

TRIAL EXAMINER: Counsel had better proceed with the questions.

MR. HULL: Thank you.

By MR. HULL:

Q. Dr. Dorau, will you explain this tabulation and chart, please?

TRIAL EXAMINER: There is an objection to that. The tabulation and chart referred to as the chart headed, "Pennsylvania Water & Power Company, Original Cost of Electric Plant in Present Dollars," and the tabulation headed "Original Cost of Electric Plant in Present Dollars—the Purchasing Power of the Dollar as Measured by Wholesale Prices as Reflected

by a Seven-Year Moving Average—1905-1945", is that correct?

MR. HULL: Yes.

TRIAL EXAMINER: The Examiner will sustain the objection to that question on the ground that inseparably bound [835] up in that tabulation and in the chart is this matter of original investment in electric plant in 1945 dollars.

MR. HULL: Is that in addition to your Honor's previous ruling?

TRIAL EXAMINER: That is a statement of the grounds for the ruling.

MR. HULL: I will proceed.

By MR. HULL:

Q. Dr. Dorau, is the \$50,091,106.00 indicated on the tabulation and chart upon which the Examiner has just ruled, the cost of reproduction of electric plant in service as of December 31, 1945?

MR. GOLDBERG: Mr. Examiner, before the witness answers, and before I object, I would like to make one comment. One figure is \$50,091,000 odd, which is the figure which appears on the tabulation; and then we have the figure of \$50,093,000 odd on the chart. I assume that the figure on the chart was rounded off, but it was rounded off to too great an extent.

MR. HULL: My question really refers to the same figure, whether there is some typographical error or not.

MR. GOLDBERG: I was wondering whether they were the same, or whether there was some arithmetical error.

MR. HULL: I think there is.

MR. GOLDBERG: I object to any testimony bearing on the figures stated by counsel which are the results

of the [836] application of the purchasing power of the dollar.

TRIAL EXAMINER: Let the Examiner ask the witness a question whether that is or not true: Doctor, is it or not a fact that the \$50,093,000 is or not the result of the application of the purchasing power of the dollar to the original cost of electric plant of Pennsylvania Water & Power Company?

THE WITNESS: Yes, as calculated and established, and as previously described.

TRIAL EXAMINER: The objection is sustained.

By Mr. HULL:

Q. Dr. Dorau, is the determination in this exhibit the same as the trended original cost? **A.** No, it is not.

MR. GOLDBERG: Same objection. I move to strike the last answer to the extent given.

TRIAL EXAMINER: The answer as given by the witness to the pending question is stricken. The objection to the question is sustained.

By Mr. HULL:

Q. Dr. Dorau, in your opinion, is the fair original cost in homogeneous current dollars a useful factor in the determination of a fair return under regulation?

[837] **MR. GOLDBERG:** Same objection, Mr. Examiner?

TRIAL EXAMINER: Objection is sustained.

By Mr. HULL:

Q. Dr. Dorau, in your opinion, is the fair original cost in—I beg your pardon, I asked you that question—is it, in your opinion, useful for the determination of the rate base or the fair rate of return? **A.** It—

MR. GOLDBERG: Same objection.

TRIAL EXAMINER: The objection is sustained.

MR. GOLDBERG: Mr. Examiner, may I add at this time that obviously, since the index used by the witness does not relate to utility construction costs, it is utterly immaterial and irrelevant to any issues in this case.

TRIAL EXAMINER: You may proceed.

MR. HULL: Now, Mr. Examiner I desire to offer in evidence Exhibit No. 33.

The Respondents offer to prove by the witness on the stand, Dr. Dorau, a duly qualified economist with a wide experience in the field of public utility regulation, that he has made studies and prepared exhibits based on reliable statistics which have been compiled by the several departments and bureaus of the United States Government, which show the following:

First, the amount of money in circulation, and the [838] availability for the purchasing of commodities and services, and for investment in each of the years from 1916 to 1945, inclusive.

Secondly, the purchasing power of the dollar in each year from 1905 to 1945, inclusive, as measured by wholesale prices and as reflected by the seven-year moving average, and

Third, upon the basis of these studies and data furnished to him by Respondents and in evidence in this proceeding before the Commission to show:

(a) The original investment of the Respondents in the electric plant in each year from 1905 to 1945, both, inclusive, measured by nominal dollars.

(b) The same original investment in each year from 1905 to 1945, both inclusive, measured by dollars having a purchasing power of dollars in 1945.

(c) The original investment of the Respondents in electric plant was cumulative to the end of each year

from 1905 to 1945, inclusive, measured in nominal dollars, and

(d) The same original investment cumulative to the end of each year from 1905 to 1945, inclusive, measured by dollars having the purchasing power of dollars in 1945.

These studies and exhibits and the testimony of Dr. Dorau relating to it are further offered for the following purposes: First, to be considered and weighed by the Commission in determining the appropriate rate of return which the [839] Commission should apply to the rate base of the Respondent companies in order to determine the rates, charges, classifications, rules, regulations, practices or contracts of the Respondents, subject to the jurisdiction of the Commission, if any, are just and reasonable rates, charges, classifications, rules, regulations, practices or contracts to be observed and enforced.

Secondly, to be considered and weighed by the Commission in determining the rate base to which the Commission should apply the appropriate rate of return in order to determine whether the rates, charges, classifications, rules, regulations, practices or contracts of the Respondents which are subject to the jurisdiction of the Commission, if any, are just and reasonable rates, charges, classifications, rules, regulations, practices or contracts to be observed and enforced.

Third, to be considered and weighed by the Commission in ascertaining how many dollars having the purchasing power of 1945 dollars, the Respondents must receive in the near future from their operations in order to avoid the infringement of their constitutional right under the Fifth Amendment to the Constitution of the United States to earn a fair return for the amount of the property which they have dedicated to the public use.

Fourthly, to be considered and weighed by the Commission [840] the actual investment which the investors of Respondents have made in the property which they have dedicated and devoted to public use.

MR. GOLDBERG: Mr. Examiner—

TRIAL EXAMINER (interposing): Has counsel finished?

MR. HULL: Yes.

MR. GOLDBERG: May I inquire, first, whether that offer also includes the offer of the Exhibit No. 33?

MR. HULL: It is intended to include the exhibit excepting insofar as the testimony found in the exhibit is of record.

MR. GOLDBERG: The thing that troubles me—I tried to listen carefully—it seems to me that, at the outset, the offer of proof undertook to prove through the witness on the stand testimony which the Examiner has admitted in the first twelve pages of the witness' testimony.

[841] MR. HULL: All I intended to include in the offer was the testimony in the latter part, which was excluded by the Examiner as the questions were asked.

MR. GOLDBERG: With that amendment, I think that clears it up.

With respect to the exhibit, Mr. Examiner, I might state that I do not object to the first chart, as such; nor to the tabulation following that first chart, as such; since that is related to the testimony which has been admitted;

Nor do I object to the third tabulation, consisting of 2 pages, the testimony relating to that, Mr. Examiner, has been admitted.

It is the ~~second~~ tabulation in the exhibit.

But I do object, Mr. Examiner, to the tabulation, consisting of 2 pages, which precedes the last page of exhibit, and to the last page of the exhibit, which is the chart applying Dr. Dorau's theory.

I recognize that the portions of the exhibit to which I have objected contain evidence which has already been admitted, in part, and is being offered for admission, in part.

I have reference to the original investment in electric plant in terms of nominal dollars as expressed by this witness in his exhibit; to the purchasing power of the dollar—1945 equals 100, as expressed by the witness in his exhibit.

Inasmuch as, however, Mr. Examiner, such evidence is [842] already in the record, and will be received in the record, I assume, I do not exclude those portions of the tabulations of the chart to which I have objected from my objection.

. . .

TRIAL EXAMINER: The Examiner will rule to exclude Exhibit No. 33, with the following statement:

That if the data contained on the chart headed, "Deposits, Investments and Loans of All Banks; Currency in Circulation and Gold Stocks 1914-1946 (millions of dollars)" and the tabulation headed likewise;

[843] And the further tabulation entitled, "The Purchasing Power of the Dollar as Measured by Wholesale Prices as Reflected by a Seven-Year Moving Average—1905-1945," are submitted in the form of a separate exhibit, that exhibit will be received in evidence.

The further evidence of the witness, Dorau, as stated in counsel's offer of proof, will not be received.

MR. HULL: Mr. Examiner, in view of your Honor's ruling, we may wish to submit a new exhibit including the tabulations which you indicated you would admit.

However, we are very near the end of our direct case, and it may not be physically possible for us to make up those exhibits in time to get them in before the conclusion of our direct case. May we have leave to submit them as soon as it is possible to prepare them?

TRIAL EXAMINER: Yes, advising the Examiner as early as possible when you expect to be able to submit the new exhibit.

. . .

[844] MR. MILLER: Mr. Examiner, I move that the order of procedure be changed so that Pennsylvania Public Utility Commission may produce its evidence on the issue of allocation of any rate reduction after Pennsylvania Water & Power Company, the Federal Power Commission Staff, and Consolidated Gas Electric Light and Power Company of Baltimore have presented their evidence on this issue.

The basis for this motion is the belief that under the suggested changed procedure, duplication of testimony would be avoided and our evidence could be presented in more concise and expeditious form.

MR. FRANCE: If Your Honor please, the Public Service Commission of Maryland likewise desires to move that the order of procedure be changed so that it will be permitted to introduce its evidence after the staff of the Federal Power Commission has introduced their evidence.

TRIAL EXAMINER: The Examiner may say that he has been authorized by the Commission to entertain the motions that counsel have now made, and the Examiner assumes that counsel for the Consolidated Gas Electric Light and Power Company of Baltimore renews his motion made yesterday afternoon?

[845] MR. STURTEVANT: I do.

TRIAL EXAMINER: Upon further deliberation, the Examiner will rule that the order of presentation of evidence in this proceeding be changed so that the Commission Staff's presentation of evidence will immediately follow completion by the Company of its presentation, and thereafter the order as between Consolidated Gas Electric Light and Power Company of Baltimore, Pennsylvania Public Utility Commission and the Public Service Commission of Maryland will be observed as previously set.

You may proceed with the witness.

MR. SPARKS: If Your Honor please, may the order to which Your Honor has referred authorizing you to change the order of procedure be made a part of the record in this case by reference?

TRIAL EXAMINER: I don't know in just what form that is and I am not able to rule in accordance with that at this moment. The Examiner does not consider it necessary, however.

MR. SPARKS: May I ask Your Honor then as to the date when Your Honor was authorized to change the order of procedure in the case?

TRIAL EXAMINER: Yes, the Examiner was authorized this morning.

MR. SPARKS: This morning?

TRIAL EXAMINER: Yes.

[849]

GEORGE W. SPAULDING,

DIRECT EXAMINATION.

By MR. MYSE:

Q. Mr. Spaulding, considering the nature of Penn Water's and Safe Harbor's contracts with Baltimore Company, and the coordinated operation of their hydro resources with the steam generating resources of their customers, including Baltimore, is it your opinion that a cost of service determination can be made of Penn Water's and Safe Harbor's costs for firm power services rendered to Baltimore Company? A. Yes, it is.

[850] Q. Have you made such a study? A. Yes, such a study has been made under my direction.

Q. Will you state the results of that study? A. That study shows that Penn Water's and Safe Harbor's costs for the firm power services rendered to Baltimore Company in 1945, were \$5,645,000, and that the costs for such services to be rendered in 1946 are estimated to be \$5,623,000.

Q. Are such cost determinations for firm power services only? A. Yes.

MR. MYSE: Mr. Examiner, I ask to have identified as Exhibit No. 34 a chart with the label thereon: "Pennsylvania Water and Power Company, Safe Harbor Water Power Corporation and Susquehanna Transmission Company of Maryland—Facilities Used in Rendering Firm Power Services to Baltimore Company."

TRIAL EXAMINER: The document may be marked Exhibit No. 34 for Identification.

(The document referred to was marked Exhibit No. 34 for Identification.)

By MR. MYSE:

Q. Mr. Spaulding, does this chart which has been marked for identification Exhibit No. 34 show the general

location of the facilities used in rendering firm power service to Baltimore Company? A. It does.

[856] Q. Do the costs determined for firm power services rendered to Baltimore Company in your study include the costs incurred by Penn Water and Safe Harbor in rendering services to the Pennsylvania Railroad in Maryland? A. Yes, it does.

Q. How are Penn Water and Safe Harbor compensated for such costs? A. The costs incurred by Safe Harbor in rendering joint services to Pennsylvania Railroad in Maryland are included in the basis for the bills rendered by Safe Harbor to Baltimore Company and Penn Water under the Safe Harbor contract identified as Items E, F and G.

In connection with such billing, as shown by Exhibit 17, Baltimore Company pays Safe Harbor 2/3 of such cost and Penn Water pays 1/3. Penn Water's compensation for its costs incurred in rendering joint services to Pennsylvania Railroad in Maryland is received as revenue from Baltimore Company under Penn Water's agreement with Baltimore Company, identified as Items H and I; costs for such services are included in the basis for the bills rendered under this contract.

[862] Q. Are you familiar with Exhibit 31 prepared by Mr. Tate offered in evidence and with the supporting testimony offered in this proceeding? A. Yes.

Q. Are you familiar with Exhibit 32 prepared by Mr. Hall and offered in evidence and with the supporting testimony offered in this proceeding? A. Yes.

Q. Are you familiar with Exhibits 29 and 30 prepared by Dr. Foster and offered in evidence and with the supporting testimony that he offered in this proceeding? A. Yes.

Q. From your knowledge of Exhibits 29 and 30 and 31, can you say whether or not the cost of firm power serv-

ices rendered to Baltimore Company by Penn Water for 1945 and 1946 would be increased or decreased if you had used the property construction costs from Mr. Tate's Exhibit 31, together with the appropriate rate of return as testified to by Dr. Foster, instead of the investment costs and the rate of return used in your Exhibit 35?

MR. GOLDBERG: Objection, Mr. Examiner, on the ground that the question involves proposed testimony and exhibits [863] offered which were excluded.

TRIAL EXAMINER: Objection sustained.

MR. MYSE: I take an exception.

By MR. MYSE:

Q. From your knowledge of Exhibits 29 and 30 and 32 can you say whether or not the cost of firm power services rendered to Baltimore Company by Penn Water for 1945 and 1946 would be increased or decreased if you had used the property costs from Mr. Hall's Exhibit 32, together with the appropriate rate of return as testified to by Dr. Foster instead of the investment costs and rate of return used in your Exhibit 35?

MR. GOLDBERG: Objection.

TRIAL EXAMINER: Objection sustained.

MR. MYSE: In view of the Examiner's rulings to the last two questions, I desire to make a proffer. We offer to prove by the testimony of this witness, Mr. Spaulding, that Penn Water's costs of rendering firm power services to Baltimore Company are \$560,000 in excess of Penn Water's costs shown on Exhibit 36 if the property construction costs shown in Mr. Tate's Exhibit 31 are used together with the appropriate return as testified to by Dr. Foster or offered in evidence in connection with his testimony, instead of the investment costs and return used in Exhibit 35.

Likewise, we offer to prove by this witness that [864] Penn Water's costs of rendering firm power serv-

ices to Baltimore Company are \$269,000 in excess of Penn Water's costs as shown on Exhibit 36 if the costs shown in Mr. Hall's Exhibit 32 are used, together with the appropriate return as testified to by Dr. Foster or offered in connection with his testimony, instead of the investment costs and return used in Exhibit 35.

TRIAL EXAMINER: The evidence offered will not be received.

[867] **MR. HULL:** Mr. Examiner, Respondent companies have now completed the direct testimony which they have prepared and will offer for the specific purposes of determining as of December 31, 1945:

Firstly: The amount or extent of actual depreciation which existed in the properties of the companies as of that date;

Secondly: the amount of the depreciation reserve [868] balance which was adequate as of that date;

Thirdly, the amount which should be charged for annual depreciation for a reasonable period in the future beginning with that date.

They have not as yet and are not now ready to offer certain studies which they propose to prepare and offer which:

Firstly: Will show the effect of the use of a depreciated rate base which the Commission staff has indicated that it proposes to recommend to the Commission upon the investors of the two companies; and

Secondly: Will rebut the testimony which Commission counsel at transcript page 45 stated that he will present with respect to the earnings of the investors of the companies in the past.

In his opening statement of the issues, Commission's counsel beginning at transcript page 43, line 15,

and extending to page 44, line 22, stated that he would offer proof to show that the "gross investment for the rate base is \$32,920,738 which is \$5,663,494 less than Holtwood's book figures" and that the last mentioned sum "does not represent actual cost and should be disallowed."

At transcript page 45, lines 4 and 8, Commission's counsel stated that the Staff "will also present analyses of the company's past earnings which will show that the company has earned at least 10 per cent rate of return on its net [869] investment including working capital during its entire period of operations."

He further stated at transcript page 44, lines 11 to 15 that "the Staff does not propose to recommend to the Commission that Holtwood be required to change from the straight line method of depreciation it has always been using". He did not state when he referred to "the straight line method of depreciation it has always been using" that he meant to include as a part of that method the use of an undepreciated rate base with a credit to the rate payers of a reasonable rate of interest on the balance in the depreciation reserve. That is in fact the method which Holtwood has been using since 1931.

It is scarcely to be supposed that he intended to indorse that method, because later on the same page of the transcript at lines 21 and 22 he stated that "the present book reserve is not excessive and should be used in reaching a net rate base in this case".

This statement as we understand it implies that the Staff proposes to recommend that the present book reserve be deducted from the original investment in arriving at a rate base to be used in this case.

Now, a consideration of these statements of Commission counsel will show that the studies which Respondents will make and to which I have just referred are composed almost wholly of evidence that will be

in rebuttal to that which the [870] Staff will offer, and in order that these studies may be most helpful to the Commission they should be based upon the facts as presented by the Commission staff in its direct case.

In order to prepare the studies the Respondents will require all the data necessary to duplicate the Commission's Staff's computations of the depreciation reserve requirements as of December 31, 1945, for Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland, together with an explanation of the methods followed in arriving at its results.

These data should include:

(A) The amounts of depreciable property in the same detail as to accounts which Commission's Staff used in computing the company's reserve requirements and the annual allowance for depreciation.

(B) The life table used by Commission's Staff in the same detail as to elements for items of property which the staff used in computing any and all composite lives which entered into any part of their computations.

(C) The date fixed by the Commission's Staff as the date of the beginning of commercial operation of the initial project.

(D) Yearly additions to plant with the original cost and life table used with respect thereto both in the same [871] detail as to accounts which the Commission's Staff used in computing the company's reserve requirements and allowance for depreciation.

(E) Debits to the depreciation reserve by years and by accounts in the same detail as stated in Paragraph (A) above.

(F) The amounts of total investment in electric plant as of the end of each year, and the amount of working capital both as recommended by the Commission Staff.

We bring the matter to the attention of the Examiner at this time for the reason that if the Examiner should be of the opinion that the proposed studies and the testimony relating to them would not be properly in rebuttal, then the Respondent would be compelled to request to the Commission's Staff to supply these data as promptly as possible with the necessary information, and we would have to ask the Examiner for a recess of a sufficient period thereafter to permit these studies to be completed before our direct case is closed.

[872] Now, if I may repeat very briefly the fact that these studies we will make are primarily rebuttal, and if we are furnished promptly with this information that we will be able, by the time that we come to rebuttal testimony, to have the studies completed, but we do not want to close our direct case, by any chance, these are going to be ruled out as rebuttal.

TRIAL EXAMINER: As you say, this is a short summation of your entire statement.

MR. HULL: Yes.

TRIAL EXAMINER: Does Staff counsel have any statement to make in reply?

MR. GOLDBERG: Yes, Mr. Examiner, but a brief one, not as extended as Mr. Hull's, I am sure. Mr. Hull has listed a series of data which he says will be required by the companies to undertake to prepare certain studies which he states he believes are in the nature of rebuttal studies. I am pretty sure that much, if not all, of the data he mentioned will be presented by the Staff when it puts on its case, in the exhibits, or in the oral testimony, or in both. If it does not appear in the exhibits, or in the oral testimony, it

probably appears in the working papers, exhibits very often representing mere summarizations. It may be, however, that certain of the data, without attempting to name it, may not appear either in the working papers or in the testimony, or in the exhibits. [873] I am not saying that may be the case. I do not know. If that be the case, there is no obligation upon the Staff to supply any data named by the counsel that does not appear in the exhibits, or the testimony, or the working papers. The Staff presents its case on the basis that it deems sufficient. That is the only obligation it has in the case. I might inquire at this time whether Mr. Hull now commits himself to furnishing to the Staff all of the data in their possession bearing on the items enumerated by him.

MR. HULL: Mr. Examiner, as I understand it, we do not have such data and, therefore, could not supply such data. However, the data requested are, as we understand, all necessary for the computation of the reserve requirement, and the annual depreciation allowance on the theories entertained by the Commission's Staff. I am perfectly willing to commit myself at this time to furnish you with any information that we have, but some of this we do not have—

MR. GOLDBERG (interposing): All right.

[874] MR. HULL: —and never used.

MR. GOLDBERG: Then we both make the same commitments in this case, and I say to the extent there may be such information that counsel for the Respondents seeks in the working papers of the Staff or the exhibits or the oral testimony presented here it will be solely because the Staff presented its case—I mean if it is not in such places—it will be solely because the Staff presented its case in the manner that it deemed sufficient, and such data as does not appear in those

sources I state that it will be the responsibility of the Respondents to secure from their own records which are, of course, the sources of our information.

. . .

TRIAL EXAMINER: Now in the matter of counsel's statement, the Examiner is not able at this time to rule what is rebuttal and what is not proper⁴ rebuttal. The ruling can only be made when the case has progressed to a stage beyond this.

The letter addressed to Pennsylvania Water & Power Company, November 16, 1945, by the Acting Secretary of the [875] Commission, states what the order of procedure at this hearing will be as far as Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland are concerned. And the Examiner has called upon those companies to present their evidence in chief, or the case on direct, and can only leave it up to counsel for those two companies to determine what their direct testimony and evidence will be.

If counsel desires to take the risk of a later ruling on the part of the Trial Examiner as to what is proper on rebuttal, that is his responsibility. The Examiner will be guided by the general rules of law as to what rebuttal, proper rebuttal testimony is.

MR. SPARKS: May I say, Mr. Examiner, that we have about reached the point where we would normally close, but Mr. Hull has pointed out the situation which results from the order of the Commission requiring us to go first, in this respect: That we were not advised of any of Commission's counsel's contentions until the opening part of the case. It was, therefore, incumbent upon us to guess as to what we ought to put in, as to what might meet future contentions that may be made by Staff counsel, and by others, all others, in fact. So it looks to us as if your Honor's ruling leaves us in

this position where we cannot say that our direct testimony is closed, since it may very well be that other testimony we have, when we have seen the Commission's case, will be relevant, [876] but may be subject to a technical statement as to whether it is direct or rebuttal, or redirect. So I am saying, in substance, simply this, your Honor, that we have completed our presentation and we have complied with the order as far as we can see, but we do not feel that we ought to be required to say that our direct testimony is now completed when we are not in the position, because of the order of procedure, to state whether or not our direct testimony is completed.

TRIAL EXAMINER: What was that last?

MR. SPARKS: What I am saying, in substance, is simply this, your Honor, that we believe we have complied with the order as far as we can see, but we do not feel that we ought to be required to say that our direct testimony is now completed when we are not, in fact, in a position because of the situation in regard to the order of procedure to state whether or not our direct testimony is, in fact, completed.

Just one other point in that connection: That is this, do we understand now that your Honor has been authorized to change the order of procedure? We do not know whether that extends to the point that your Honor can say that the order may be varied so far as Respondents are concerned in respect that we have mentioned, but if so, we think that it would be proper for your Honor to permit, if it requires a variation in the order of procedure, to permit us to put on such testimony as we believe is proper after the data are in the record, [877] or after they have been furnished to us.

TRIAL EXAMINER: The Examiner said he was authorized to entertain the motions made by counsel for

the Public Service Commission of Maryland, the Pennsylvania Public Utility Commission, and counsel for the Consolidated Gas Electric Light & Power Company, and made no further statement. The Examiner's ruling on those motions was specific. The Examiner cannot change the order of procedure any further.

Counsel for the Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland will have to use their own judgment as to what they desire to put on as their direct testimony in this proceeding.

MR. SPARKS: May I point out to your Honor, then, that the ruling will require us to ask for time to gather the data that we have requested of Staff counsel to make the computations necessary for the purposes which Mr. Hull mentioned in order that we may present that as direct testimony, in the event that it may be held that testimony, or part of it, or all of it, is not proper rebuttal testimony.

TRIAL EXAMINER: The Examiner understands counsel's statement made with reference to Respondent companies having completed direct testimony that they have prepared to offer with respect to depreciation and various items related thereto, which he recited.

Counsel takes the position that he is unable to prepare [878] these studies unless he has opportunity to and is able to obtain such data from Staff counsel.

MR. SPARKS: Yes, your Honor.

TRIAL EXAMINER: Then how can counsel support a request for the recess, having that in mind?

MR. SPARKS: It is our position, if your Honor please, as Mr. Hull stated, that this evidence that we would offer, we believe, is rebuttal evidence, but it is only the factor entering into the situation that per-

haps it may be held not to be rebuttal, but to be proper direct testimony, in which event when we come to rebuttal time we would be in a rather serious predicament.

TRIAL EXAMINER: You are asking the Trial Examiner to rule at this time as to what is the scope of your direct testimony; at least what the scope of your direct testimony should be.

MR. SPARKS: I do not believe so, your Honor.

I believe I can state it this way: We are prepared to say to your Honor that this is all the evidence we have at this time, but there is the likelihood, or possibility, rather, that some further testimony we have may be termed direct testimony and in that event we merely want your Honor to permit us to put it on, and permit us to finish our case today without saying that we close our direct presentation.

MR. GOLDBERG: Mr. Examiner, I gather the impression [879] from Mr. Sparks' statement that in addition to the matters discussed by Mr. Hull, the company is thinking in terms of presenting that testimony; and also they are thinking of presenting other testimony, which I seem to gather is prepared at this time. I would like to inquire, if there is other prepared testimony, what is its nature.

MR. SPARKS: I think the answer to that is "no", if your Honor please.

MR. GOLDBERG: Now, Mr. Examiner, I would just like to say this in response to Mr. Sparks' statement, the Staff was not advised of the company's contentions in this case, but the Staff, nevertheless, prepared its case on the basis of its own investigation, and its own position on the elements of this rate case. I do not know why the Respondents could not have gone out and have done likewise. I submit further, Mr. Examiner, that the Respondents, while perhaps not as spe-

cifically advised, as they were at the outset of the hearing, of the position of the staff, they were well aware of that position, particularly certain counsel in this case who participated in the Safe Harbor Water Corporation rate case, Docket IT-5914. For that matter, Mr. Examiner, the Commission could have said to the company, "Come on in and defend your rates." There is no obligation on the Commission or the Staff or anybody else to put in any case. And the Commission could have done that and the company would have had to come forward with every bit of [880] evidence that they had in support of their position without anything else being done. The contentions of the Staff make no difference whatsoever as to that type of testimony. The fact of the matter is that all of the testimony could have been presented on the basis of the company's own contentions, not on the basis of the Staff's contentions, if the company had seen fit to do so, and could, of course, have been presented as direct testimony, but there is nothing incumbent upon the Staff with regard to the nature of the direct testimony of the company.

TRIAL EXAMINER: Counsel for the company's position is this, is it not, that without presentation of evidence by Staff counsel he would not undertake at this time any further preparation of evidence; in other words, there are no studies on these subjects which are mentioned in counsel's statement? There are no studies on those subjects now under course of preparation; is that correct?

[881] MR. SPARKS: I do not think that is quite true, because there were some statements by Mr. Goldberg with regard to the effect of a depreciated rate base, as Mr. Hull has mentioned, that we might find ourselves in the position of having to answer even though there was no testimony in the record presented by Staff counsel.

MR. GOLDBERG: If that be so—

TRIAL EXAMINER: The whole thing is that no steps are in progress on the part of the company for the preparation of testimony or exhibits for offering at this stage of the proceeding; that is your case on direct?

MR. SPARKS: That is correct, if Your Honor please, except for the corrections and what we suggest as to whether some of the testimony described by Mr. Hull may be held some time to have been proper on direct and not on rebuttal.

TRIAL EXAMINER: The counsel will not be able to determine what he shall do in that direction until the Examiner has ruled what is the proper scope of rebuttal; is that it?

MR. SPARKS: Yes.

TRIAL EXAMINER: The Examiner can only make his ruling when he arrives at that point.

MR. SPARKS: But I think Your Honor could rule that we need not be in the position of saying that our direct testimony is completed, but I think we can say that we [882] have nothing further to offer at this time.

TRIAL EXAMINER: The Examiner cannot anticipate what his ruling will be in regard to rebuttal in the light of all the discussions we have had. The Examiner will rule that this is time for the counsel for the two companies to present whatever testimony in evidence they wish to present in connection with their case in chief.

MR. SPARKS: We will take an exception.

[883] MR. SPARKS: If Your Honor please, may I ask Your Honor to direct Staff counsel to furnish or make available to Respondents the data requested by Mr.

Hull in his statement this afternoon, and to give us a recess of six weeks from the time that that is furnished or made available to us, to permit us to prepare further evidence with regard to depreciation.

TRIAL EXAMINER: This matter still has to do with the stage in this proceeding which will be reached in the due course of events and which has to do with rebuttal testimony.

The request that counsel now makes will undoubtedly be answered in part if Staff counsel now proceeds to put on his testimony.

MR. SPARKS: That, I think, is the difficulty, Your Honor. It may be answered only in part.

TRIAL EXAMINER: We will take that matter up when we come to it.

MR. SPARKS: I understand then that Your Honor has denied my request?

TRIAL EXAMINER: That is correct.

MR. SPARKS: We take an exception, if Your Honor please.

Now, if Your Honor please, we request that Respondents be given a recess of at least two weeks in order that we may do the best we can with what data we have to prepare [884] further testimony on depreciation before we close our case.

TRIAL EXAMINER: Counsel is now in no way modifying the statement which was made with regard to the Respondent companies' having completed the direct testimony which they have prepared and will offer, as contained in the statement which was made after the last witness left the stand.

MR. SPARKS: No, we are not varying that statement, if Your Honor please, but—

TRIAL EXAMINER (interrupting): This present request relates to that identical statement, does it not?

MR. SPARKS: It relates to that statement, and to the further statement that we will have some additional evidence which may be subject to the question of whether it is direct or rebuttal evidence.

TRIAL EXAMINER: The Examiner has already stated his position with regard to that question, and the request is denied.

MR. SPARKS: May I make it plain, if Your Honor please, that we did not mean to imply that we have completed and closed our direct evidence on depreciation. That was the whole purpose of the statement which Mr. Hull made.

[885] TRIAL EXAMINER: The Examiner understands counsel's position and has instructed counsel for the company to proceed at this time with such evidence and testimony as properly relates to his case in chief, and if counsel is unable to do that at this time, the Examiner will instruct that the proceedings continue at this moment.

MR. SPARKS: We take an exception to Your Honor's ruling, and I state at this time that this is all the evidence we have to offer at this time as to our case in chief, and I should like to call Your Honor's attention to the fact that there are a number of exhibits on which ruling has been reserved, so that we cannot close our case in chief until those rulings have been made.

May I also say, if Your Honor please, that for the purpose of expediting these proceedings and to advise the Respondents of the contentions of the Government, as represented by the Staff of the Commission and Commission counsel, it is requested that Commission counsel be required to state for the record the contentions of the Commission Staff as to each of the following particulars:

1. Is the authority of the Commission to regulate and control rates or charges in this proceeding to be exercised under Part I of the Federal Power Act? If so, under which sections?

2. Is it contended that either of the States of [886] Pennsylvania or Maryland has not authorized, empowered or provided a commission or other agency for the regulation and control of the rates and charges of payment for services to be rendered by Respondents or by their customers engaged in public service, within the meaning of Section 19?

3. Is it contended that either of the States of Pennsylvania or Maryland has not provided a commission or other authority to enforce the requirements of Section 20 within their respective States?

4. Is it contended that the States of Pennsylvania and Maryland are unable to agree, through their properly constituted authorities, on the services to be rendered by Respondents or on the rates or charges of payment therefor, within the meaning of Section 20?

5. Is it contended under Section 20 of the Act that the Commission has jurisdiction in this proceeding to regulate and control the services rendered by Respondents to Consolidated Gas Electric Light & Power Company of Baltimore, and to regulate and control the component part of the rates and charges of payment for such services as do not constitute interstate or foreign commerce, particularly the special facilities services comprising the furnishing of the Highlandtown substation facilities and the Gunpowder Falls transmission line in the State of Maryland?

6. Is it contended under Section 20 that the Commission [887] has jurisdiction in this proceeding to regulate and control any of the services rendered by Pennsylvania Water & Power Company, by itself or

jointly with Safe Harbor Water Power Corporation, to Metropolitan Edison Company, Pennsylvania Power & Light Company, Philadelphia Electric Company, or Pennsylvania Railroad Company, all in the State of Pennsylvania, and to regulate and control the rates and charges of payment for any of such services? If so, which services, rates and charges to which companies?

7. Is it contended that the Commission has jurisdiction in this proceeding under the Act to regulate and control or to determine and fix by order any divisions of rates or charges which may be received by Pennsylvania Water & Power Company for services rendered jointly with others? If so, which divisions?

8. Is it contended that the Commission has jurisdiction in this proceeding under the Act to regulate and control or to determine and fix by order any rates or charges for services rendered jointly with others without making such other participants in such joint services parties respondent to this proceeding?

9. Is it contended under Part II of the Act that the Commission has any jurisdiction to determine and fix by order any of the rates, charges or classifications of Pennsylvania Water & Power Company for services rendered its customers? [888] If so, is the authority of the Commission in this proceeding to be exercised under Part II of the Act, particularly Sections 206 (a) or 206 (b) thereof?

10. Is it contended under Part II that the rates or charges of Pennsylvania Water & Power Company and Safe Harbor Water Power Corporation for services to Consolidated Gas Electric Light & Power Company of Baltimore are for the transmission or the sale of electric energy, within the meaning of Sections 201 (b) and 206 (a), and that thereby the Commission has jurisdiction in this proceeding under such Sections to

determine the justness and reasonableness of such rates or charges and to fix the same by order?

11. Is it contended under Part II that the Commission has any jurisdiction in this proceeding to determine and fix by order the component part of the rates and charges of Respondents for the special facilities services rendered to Consolidated Gas Electric Light & Power Company, comprising the furnishing of the Highlandtown substation facilities and the Gunpowder Falls transmission line in the State of Maryland?

12. Is it contended under Part II that the Commission has any jurisdiction in this proceeding to determine and fix by order the component part of the rates and charges of Pennsylvania Water & Power Company and Safe Harbor Water Power Corporation to Consolidated Gas Electric Light and [889] Power Company for the services rendered by them jointly with others to the Pennsylvania Railroad Company in the State of Maryland?

13. Is it contended under Part II that the rates or charges of Pennsylvania Water & Power Company, by itself or jointly with Safe Harbor Water Power Corporation, for any of the capacity, energy or special services to Metropolitan Edison Company, Pennsylvania Power & Light Company, Philadelphia Electric Company or Pennsylvania Railroad Company, all in the State of Pennsylvania, are subject to the jurisdiction of the Commission in this proceeding? If so, which of the rates or charges for such services to which of such customer companies?

14. Is it contended under Part II that the rates and charges of Pennsylvania Water & Power Company jointly with Safe Harbor Water Power Corporation, Consolidated Gas Electric Light and Power Company of Baltimore and Potomac Electric Power Company

for services to Pennsylvania Railroad Company are sales of electric energy at wholesale, within the meaning of Sections 201 (b) and 201 (d), and are thereby subject to the jurisdiction of the Commission in this proceeding?

15. Which of the rates, charges, or classifications for services, which it may be contended are subject to the jurisdiction of the Commission in this proceeding under Part II, or which of the rules, regulations, practices or [890] contracts affecting such rates, charges or classifications is it contended are unjust; unreasonable, unduly discriminatory, or preferential?

The Respondents state that in order to expedite this proceeding in an orderly manner and to afford them a fair and adequate opportunity to know and meet any of such contentions, if made, Commission Counsel should be required to reply to the foregoing interrogatories. The complexity of the questions which may arise, as stated in the foregoing interrogatories, illustrates and shows the handicap that the Respondents have been subjected to by the orders of the Commission in this proceeding. Failure to indicate the contentions of the Government in the above respects, or in any other respect unknown to Respondents, will deprive Respondents of the fair hearing required by the Federal Power Act and by the due process clause of the Fifth Amendment to the ~~Constitution~~ of the United States.

For the foregoing reasons, it is also requested that counsel for any of the other parties to this proceeding also be required to state for the record their contentions as to each of the foregoing particulars. In addition, it is also requested that each of such other parties be required to state whether or not it is contended that the character and form of the rates, charges or classifications for services rendered by Respondents under any existing contracts or [891] the

services themselves should be changed or modified in any manner.

We ask, if Your Honor please, that the statement of contentions which we have just requested be made to the Respondents no later than the time when counsel for the Staff completes his direct testimony.

[892] TRIAL EXAMINER: With respect to counsel's statement as to contentions, the Examiner deems that no ruling is required at this time.

MR. SPARKS: That certainly is acceptable, if your Honor please, so long as we can get a statement of those contentions before counsel for the Commission closes his direct case.

TRIAL EXAMINER: At that time if counsel for the companies feels that he needs further specification of the issues, he will renew his motion to the Trial Examiner.

MR. SPARKS: Very well, sir.

MR. GOLDBERG: Mr. Examiner, I am not making any undertaking at this time to respond to any of the inquiries [893] addressed to counsel by Mr. Sparks. In the first place, I do not think that it is necessary for counsel for the Staff to take any position with respect to those matters.

Moreover, Mr. Examiner, if my recollection serves me right, all or virtually all of those claims contained in those paragraphs enumerated by Mr. Sparks were recited in one form or another in Respondents' petition for specifications of issues and reconsideration of the order of procedure, and the Commission denied that petition.

Moreover, it appears to me from the Commission's order that it has announced under what authority this proceeding would go forward, and I think that we can

take that announcement to mean that the Commission considers that it has jurisdiction under the Federal Power Act.

In any event, as I say, I am not making any commitment now with respect to those inquiries. I did not pretend to follow them. They were being read quickly and they were rather long and rather complicated.

I should like to ask of counsel—they can do it now or they can do it before this proceeding terminates, but certainly before this proceeding terminates—that they set forth in detail in what respects the companies' presentation of its case in this proceeding would be affected by the answers that would be made to those questions, whether they be yes or no or howsoever they may be made; in other words, what case would [894] they present in these proceedings had they known what the contentions were—and I submit they know what the contentions are.

I would like to have them set forth in what respects they consider specifically that they are deprived of due process of law.

I submit, Mr. Examiner, that no matter what position the Staff would take with respect to the inquiries directed to the Staff that the Respondents would present no different case than they are now presenting or will have presented when these proceedings are terminated. In no way whatsoever could the claims as to jurisdiction affect their claims as to the elements of a rate case. I know not of one element of evidence that they would present in this proceeding if the answers to the questions were one way or another, and I will await with patience and with a great deal of anticipation a response to these inquiries.

I have a few questions to direct at this time to counsel myself.

At transcript page 34, counsel stated that this Commission "has no jurisdiction over the rates, charges

and classifications of Pennsylvania Water & Power Company under Part 2 of the Act for the reason that the company is to be treated as a licensee and may be considered to be a purchaser of power from a licensee for use in public service, and is therefore [895] subject to Part 1 of the 'Act only'. Does counsel for the respondent mean by that statement that the Commission must treat the respondent as a licensee? That is the first question. *o*

MR. SPARKS: Do you expect an answer now in view of your reply to my inquiries?

MR. GOLDBERG: That is a very simple question and it is set forth in the transcript. If you feel you cannot answer it now, I have no objection to your thinking it over.

MR. SPARKS: I have no doubt that I can answer it, but I would like to know what your other questions are.

MR. GOLDBERG: Surely. Is it the contention of the respondents that Penn Water is presently subject to Part 1 of the Act including Section 20, assuming that the prerequisites of Section 20 are valid and have been met, and by "prerequisites" I mean those alleged conditions in Section 20 to which counsel has already referred?

MR. SPARKS: The question is not clear to me, if your Honor please.

MR. GOLDBERG: What is there about the question that counsel does not understand?

TRIAL EXAMINER: The reporter will repeat it.

(The record is read.)

MR. SPARKS: I don't know which prerequisites he is talking about, if your Honor please. Section 20 is a long [896] paragraph.

TRIAL EXAMINER: Very well.

MR. GOLDBERG: I will specify. I have reference to this phrase "or such states are unable to agree through their properly constituted authorities on the services to be rendered or on the rates or charges of payment therefor".

Now, the next question is: When counsel made the statement "may be considered to be a purchaser of power from a licensee for use in public service and is therefore subject to Part 1 of the Act only", which appears at transcript page 34, lines 10 to 12, did counsel mean by that statement that Penn Water must be treated as subject to Part 1 of the Act, if subject to the Act at all, because it purchases electric energy from Safe Harbor, a licensee under Part 1?

TRIAL EXAMINER: Read that.

(The record is read.)

TRIAL EXAMINER: Before we get into a discussion of all of these contentions, which it occurs to the Examiner is more properly a matter for briefs, the Examiner will ask counsel how necessary it is to have answers at this time in his proceeding with his direct evidence?

MR. GOLDBERG: Having stated a contention in the record, Mr. Examiner, I believe I am entitled to know what it means, and all my questions are related to a clarification of their first contention set forth on page 34 of the transcript.

[897] My other questions, about due process and what sort of a case they would have put in here if they knew what the answers to the questions would be—which I submit they know—and that, Mr. Examiner, relates to matters directed to the Staff counsel.

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[898]

STANLEY W. ROLAND,

a witness called by Federal Power Commission, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. GOLDBERG:

Q. Please state your name and address. A. Stanley W. Roland, 4316 North Glebe Road, Arlington, Virginia.

Q. Mr. Roland, may I suggest that you speak up? They cannot hear you over to the left of me at the table. What is your occupation? A. Electrical engineer.

Q. Are you employed by the Federal Power Commission? A. Yes, sir.

Q. What is your position with the Federal Power Commission? A. I am the head of the Electric Rate Investigation Section in the Division of Rates and Certificates.

Q. How long have you been employed by the Federal Power Commission? A. Since April, 1934.

Q. Will you state your educational training as it relates to your profession? A. I received the Bachelor of Science Degree in [899] Electrical Engineering from the University of Wisconsin in 1926. Received the Master of Science Degree in Electrical Engineering from the Harvard Engineering School in 1933. Completed graduate courses in Public Utility, Economics and Power Transmission at the Massachusetts Institute of Technology during the summer of 1931.

I also did some graduate work in Electrical Engineering in connection with my teaching at the Michigan State College and at the University of Missouri.

Q. Please describe your experience as an engineer before coming to the Federal Power Commission? A. Prior to entering the University of Wisconsin, I was employed for about six months as an apprentice electrician for an electrical contractor in Rockford, Illinois, and for about 1½ years as a meter-tester and as an electrician on

substation construction work for the Rockford Electric Company.

Between school terms, while attending the University of Wisconsin, I was employed by the same company as an electrician for maintenance and new construction work at its combined steam and hydroelectric power station at Rockford. I also worked as a draftsman and inspector in the company's distribution department.

Following graduation from the university I was employed as a cadet engineer by The Milwaukee Electric [900] Railway & Light Company. By that Company I was first assigned to the electrical maintenance crew at Lakeside steam electric station, and from there I was transferred to the Power Sales Department where I stayed until 1928. My work in that department consisted primarily in making studies of the comparative costs of purchased power and power generated at customer-owned power plants.

I also made studies and recommendations regarding the installation of capacitors and synchronous motors on customers' premises, and worked together with the engineering department in planning customer-owned substations.

During the 1928 and 1929 school-year, I was employed as an instructor in Electrical Engineering at the Michigan State College, Lansing, Michigan.

From 1929 to 1932, I was employed as an instructor in Electrical Engineering at the University of Missouri. During the summer of 1930 I was employed as a test engineer in the Power Transformer Department of the General Electric Company, Pittsfield, Massachusetts.

I came with the Federal Power Commission in 1934. During the school-year 1940-1941 I was an associate in Electrical Engineering at George Washington University, teaching an evening class in Electrical Engineering.

Q. Would you describe in general the nature of your experience with the Federal Power Commission? A. When I first came with the Commission in April, [901]

1934, I was assigned to work on the preparation of questionnaire forms to gather engineering and statistical information for the National Power and National Electric Rate Surveys, and to set up the machinery for obtaining this information from all the major electrical utility companies in the United States.

After completing this work I was assigned to assist the Chief of the Power Requirements Division in studying the possibility of interconnecting and coordinating the operations of the hydro and steam-electric facilities in several of the Southeastern states, and to devise methods for making similar studies for other areas in the country.

I spent about one year as a special assistant to the Commissioner in charge of the National Power and Electric Rate Surveys, devoting my time principally to review and analysis and editing of numerous engineering and statistical reports prepared by the staff of the Surveys.

Subsequently, I devoted some time to the preparation of the questionnaire form called "Power System Statement" Form No. 12, which is used to gather data on the facilities and operations of electric power systems in the United states.

[902] In 1938, several Commission engineers, and I, were loaned to the City of Fort Worth, Texas, to make field and office studies to determine the cost of constructing an electric distribution system for the city. For two years, I made office and field studies of the facilities and operations of a number of electric utilities to determine whether or not such facilities were subject to the jurisdiction of the Federal Power Commission. ✓

These studies included analyses of contracts, computations and preparation of exhibits relating to energy flows over the facilities of Jersey Central Power and Light, Public Service Electric and Gas Company of New Jersey, and of the Staten Island Edison Corporation, Docket IT-5518.

I also made field studies of the facilities, operations, energy transfers across state boundaries, and sales at

wholesale of a number of operating companies comprising the New England Power and Western Massachusetts Companies.

I made similar field studies regarding energy flows on the Hartford Electric Light Company and Connecticut Power Company system.

In connection with Docket IT-5513, involving New York Power and Light Corporation and Twin States Gas and Electric Company, I made a field study and testified as to the facilities used for the transmission and sale of electric energy across a state boundary.

[903] I have participated in other proceedings before the Commission involving studies of power contracts and of the facilities for the transmission and sale at wholesale of electric energy transmitted to or from points outside the State.

During the course of my employment with the Commission, I have had a number of special assignments covering technical studies relating to the adequacy of transmission facilities; engineering and economic studies to determine probable markets for power in the vicinity of proposed hydroelectric projects; field and office studies regarding the facilities and operations of The Deepwater Operating Company and the Delaware Power and Light Company, in connection with a preliminary investigation of the rates charged the Philadelphia Electric Company; analysis of documents submitted by public utilities regarding the proposed sale of their properties, and the preparation of reports thereon to the Commission covering the engineering and economic aspects of such proposals; field investigations and cost studies in connection with the Commission's investigation of the southwest power pool which was formed to supply power to a large aluminum plant in Arkansas.

I spent about one year analyzing the proposed cost of special facilities involved in war power contracts subject to Commission review under the President's directives, to determine their reasonableness. Immediately prior to the

assumption of my present duties, I was head of the Transmission [904] Section in the Commission's Bureau of Power.

Q. Who is your immediate supervisor at the present time? A. Mr. Edgar S. Coffman, Chief, Division of Rates and Certificates.

Q. Is your work in the Division assigned by Mr. Coffman? A. Yes.

Q. What assignments were you given in connection with this proceeding? A. I was instructed by Mr. Coffman to prepare a report describing the facilities and operations of Pennsylvania Water and Power Company, and the Susquehanna Transmission Company of Maryland's properties; to estimate the probable service lives of the properties owned by these two companies; to make a study of the transmission of electric energy by Pennsylvania Water & Power Company and by Susquehanna Transmission Company of Maryland, from Pennsylvania to points of sale at wholesale for resale in Maryland and from Maryland to points of sale at wholesale for resale in Pennsylvania.

I was also instructed to estimate the cost to Pennsylvania Water & Power Company of furnishing electric service to its resale customers, and to ascertain the date that commercial operations of the Holtwood hydroelectric project commenced.

Q. What parts of this assignment did you personally [905] undertake? A. I prepared the estimates of probable service lives and made the study of transmission of electric energy across state lines.

The other assignments were handled by Mr. George Davis and Mr. Clifton Howell, under my general supervision. Mr. Howell assisted me in my assignment regarding service lives as did Mr. M. E. Bybuth and Mr. I. C. Jeffery, both of whom are no longer with the Commission.

Q. As a result of studies made, are you prepared to state whether Pennsylvania Water & Power Company owns

and operates facilities for the generation of electric energy? A. I am.

Q. Does Pennsylvania Water & Power Company own and operate facilities for the generation of electric energy?

A. Yes, it does. In my testimony, I usually refer to Pennsylvania Water & Power Company as "Holtwood".

Q. What type of generating facilities does Holtwood own and operate and where are they located? A. Holtwood owns and operates a hydroelectric plant and a steam electric plant, both of which are located on the Susquehanna River at Holtwood, Pennsylvania. In my testimony, I usually refer to these plants as the Holtwood plants.

Q. Does Holtwood own and operate facilities for the transmission of electric energy? [906] A. Yes:

Q. Does the Susquehanna Transmission Company of Maryland own and operate facilities for the transmission of electric energy? A. Yes. In my testimony, I usually refer to Susquehanna Transmission Company of Maryland as "Susquehanna".

Q. Are the facilities owned and operated by Holtwood and Susquehanna usually referred to as the Holtwood System? A. Yes, they usually are, and in my testimony when I refer to the Holtwood System, I refer to the facilities owned and operated by Holtwood and Susquehanna.

Q. Does Holtwood receive electric energy from other electric utility companies? A. Yes.

Q. From what companies does Holtwood receive electric energy? A. From the Safe Harbor Water Power Corporation, Metropolitan Edison Company, Pennsylvania Power and Light Company, Philadelphia Electric Company, and Consolidated Gas Electric Light & Power Company of Baltimore.

Q. Have you made a study to determine whether or not the transmission facilities owned and operated by Holtwood and Susquehanna Transmission Company of Maryland transmit energy from a state to points outside thereof? A. I have.

[907] Q. Will you outline briefly the sources of information which you employed in making the studies which you stated you have made? A. I examined reports which are filed with the Federal Power Commission each year by Holtwood and Susquehanna. The reports designated "Power System Statement", Federal Power Commission Form No. 12, contain system operating data, maps, diagrams and other engineering data.

Other reports which I examined are designated "Annual Report", Federal Power Commission Form No. 1, and contain financial and operating data as well as information as to physical facilities.

I also examined information which I obtained from Holtwood especially for these studies, regarding the amounts of generation at the Safe Harbor and Holtwood plants, energy transfers over various circuits, energy sales by Holtwood, points of delivery and metering for various periods of time which I specified.

I also discussed matters relating to energy flow, interconnection points, metering points, and points of sale to other utilities with engineers at Holtwood.

Holtwood also furnished me with a pamphlet containing system engineering data, which I used, and I examined some of the facilities involved in these studies, in the field.

MR. GOLDBERG: Mr. Examiner, at this time I ask to [908] have marked for identification as Exhibit No. 37 a map entitled, "Transmission Lines and Interconnections of the Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland."

TRIAL EXAMINER: The map will be marked Exhibit No. 37 for Identification.

(The document referred to was marked Exhibit No. 37 for Identification.)

By MR. GOLDBERG:

Q. Mr. Roland, what do those various sources of information which you employed in making your studies show regarding the ownership of transmission lines by Holtwood and Susquehanna? A. In answering that question, I would like to refer to a photostatic copy of a transmission map which Holtwood filed with the Federal Power Commission in its Federal Power Commission Form No. 12, "Power System Statement" for 1944, and which carries Holtwood file number A-130463, which is now Exhibit No. 37.

This map marked for identification as Exhibit No. 37 shows the transmission lines owned and operated by Holtwood and Susquehanna as well as transmission lines owned by others. The solid black lines shown as located within the State of Pennsylvania designate transmission lines owned and operated by Holtwood.

The solid black lines shown as located within the State [909] of Maryland designate transmission lines owned and operated by Susquehanna. A short section of 110 kv line extending from Consolidated of Baltimore's Philadelphia Road Substation, located across the street from Highlandtown Substation, to its Gunpowder Substation, is owned by Susquehanna but leased to the Baltimore Company. This is shown as a dashed line on the map.

Q. What does Exhibit 37 show with respect to the various lines owned and operated by Holtwood and Susquehanna? A. Exhibit 37 shows for each line owned and operated by Holtwood and Susquehanna the type of supporting structure, kva rating per phase, frequency, number of circuits per structure, kva rating per circuit, length of the line, and the size and type of conductor.

For example, the two lines shown in heavy black are 220 kv, three-phase, 60 cycle, single circuit lines supported on steel towers.

The two lines extending from Holtwood to Highlandtown are 66 kv, 3-phase, 25 cycle, each line consisting of two circuits supported on steel towers.

The line extending from Conestoga Substation near the Safe Harbor plant to Perryville, Maryland, consists of four 132 kv single phase, 25 cycle circuits supported on steel towers.

The line from Holtwood to Coatesville consists of two [910] 66 kv, 3 phase, 60 cycle circuits, supported on steel towers.

The line from Holtwood to York is also two 66 kv, 3 phase, 60 cycle circuits, supporting on steel towers. The tie line between the Safe Harbor and Holtwood Plants is also double circuit, 66 kv, 3 phase, 60 cycle, supported on steel towers.

Q. Are the lines which you have described facilities for the transmission of electric energy? A. Yes, they are.

Q. Does Holtwood deliver electric energy to other companies which those companies sell? A. Yes.

Q. To what companies does Holtwood deliver such energy? A. Consolidated Gas Electric Light and Power Company of Baltimore; Pennsylvania Power and Light Company; Philadelphia Electric Company; Metropolitan Edison Company, and to Pioneer Electric Company.

Q. Does Holtwood deliver any electric energy to any other person? A. Yes.

Q. To whom does it make such deliveries? A. To Pennsylvania Railroad Company.

Q. Under what contracts are Holtwood's deliveries made to other utility companies? A. Deliveries to the Baltimore Company are made under [911] contracts in evidence in this proceeding as Items E, F, G, H and I.

Deliveries to Pennsylvania Power and Light Company and to Pioneer Electric Company are made under Lancaster Power Supply contract of May 1, 1933, between Holtwood, Safe Harbor and Pennsylvania Power and Light Company, as supplemented by agreements of June 19, 1934, November 1, 1939, and October 14, 1941.

Firm deliveries to Philadelphia Electric Company are made under Coatesville Power Supply contract of August

1, 1933, between Holtwood, Safe Harbor and Philadelphia Electric Company, as supplemented by agreement of December 13, 1938.

The sale of interchange power to Philadelphia Electric Company through the Pennsylvania Railroad is provided for in the parallel operation agreement of June 22, 1938, between Baltimore Company, Philadelphia Electric Company, Safe Harbor, Holtwood and Pennsylvania Railroad, and in the interchange and load shifting agreement of June 22, 1938, between Holtwood and Philadelphia Electric Company.

Deliveries to Metropolitan Edison Company are made under contract of November 15, 1945, between Holtwood and Metropolitan Edison Company.

Q. Have you examined the contracts which you have just named? A. Yes.

[912] Q. Have you examined the billings under those contracts? A. Yes.

Q. Does Holtwood receive delivery of electric energy under any of those contracts from any of the companies to which it makes deliveries? A. Yes.

Q. Will you name them? A. Baltimore Company, Pennsylvania Power & Light Company, Philadelphia Electric Company and Metropolitan Edison Company.

Q. Does Holtwood receive payment from any of the companies to which it makes deliveries of electric energy under any of the contracts which you named? A. Yes.

Q. What service does Susquehanna perform? A. Susquehanna is engaged solely in transmitting energy for Holtwood.

Q. Does Holtwood sell any of the electric energy delivered under any of the contracts to which you have referred? A. Yes.

Q. To what companies does Holtwood sell electric energy delivered to those companies by Holtwood under any of the contracts to which you have referred? A. Baltimore Company, Pennsylvania Power & Light Com-

pany, Philadelphia Electric Company and Metropolitan Edison [913] Company.

Q. Does Holtwood sell electric energy under those contracts to any of the four companies which you named, for resale? A. Yes.

Q. Will you name the companies? A. Baltimore Company, Pennsylvania Power & Light Company, Philadelphia Electric Company and Metropolitan Edison Company.

Q. I take it that by the Baltimore Company you mean the Consolidated Gas Electric Light and Power Company of Baltimore? A. Yes, sir.

Q. Does Exhibit 37 designate the points at which the Holtwood System interconnects with the facilities of other utility companies? A. Yes.

Q. At what points does the Holtwood System connect with the facilities of Consolidated Gas Electric Light & Power Company of Baltimore? A. The Holtwood System connects with the facilities of the Baltimore Company at the latter's Riverside and Westport Substations and at Susquehanna's Highlandtown Substation in Baltimore, Maryland. These three points are designated on the transmission map, Exhibit No. 37, by the symbol "W".

[914] Q. Does Holtwood deliver energy to Baltimore Company at these points? A. Yes.

Q. Does Holtwood make deliveries of energy to others for the account of Baltimore Company? A. Yes.

Q. At what points are such deliveries made? A. Holtwood delivers energy to the Pennsylvania Railroad at Conowingo and Perryville, Maryland, for the account of the Baltimore Company. These points of delivery are designated by the symbol "W-1". I am referring to Exhibit 37 again.

When I say that Holtwood delivers energy to the Railroad Company at these points for the account of the Baltimore Company, I mean that the actual sale to the Railroad Company is made by Baltimore, but the energy sold is

transmitted to these points over facilities owned and operated by Holtwood and Susquehanna.

Holtwood also delivers energy to the Potomac Electric Power Company for the account of the Baltimore Company at the point of connection of the 220 kv transmission facilities owned by Susquehanna Company and the 220 kv facilities owned by the Potomac Electric Power Company, at a point northeast of Takoma Park, Maryland. At this point, designated on Exhibit 37 as "W-1", the sale of energy to the Potomac Electric [915] Power Company is made by the Baltimore Company.

Q. What are, in general, the facilities by means of which the sales of electric energy by Holtwood, for resale, to which you have testified are made? A. Such facilities include transmission lines, substations, metering and other equipment used for recording and billing the amounts sold.

Q. Have you made studies to determine, for some particular period, the amounts of electric energy transmitted from Pennsylvania, over the facilities of Holtwood and Susquehanna across the Pennsylvania-Maryland state line to points of delivery in Maryland? A. Yes.

Q. Upon what information are these studies based? A. They are based upon information furnished me by Holtwood showing the amounts of energy transmitted over those circuits from Holtwood to the Baltimore Company, in Maryland, and to the Potomac Electric Power Company during the years 1943 and 1944. Potomac Electric Power Company's facilities are usually referred to as the Washington System.

The combined facilities of Consolidated Gas Electric Light & Power Company of Baltimore, and of Potomac Electric Power Company, are usually referred to as the Baltimore-Washington System. In my testimony, I sometimes use these abbreviations.

[916] MR. SPARKS: YOUR HONOR, I wonder if the witness could go a little more slowly. It is very hard to follow

him when he is speaking so rapidly, and Mr. Goldberg is speaking so rapidly.

THE WITNESS: I will be glad to do so.

By MR. GOLDBERG:

Q. Is electric energy also transmitted over the transmission facilities owned and operated by Susquehanna and Holtwood from the Baltimore-Washington System to the Holtwood System in Pennsylvania? A. Yes.

Q. Have you made studies to ascertain the quantities of energy which have been so transmitted? A. Yes.

Q. Have you prepared an exhibit showing the quantities of energy which have been so transmitted? A. Yes.

MR. GOLDBERG: At this time, Mr. Examiner, I ask to have marked for identification as Exhibit No. 38 a tabulation entitled "Electric Energy Transfers Across Maryland-Pennsylvania Boundary over Facilities of Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland, by Months, Values in Megawatthours."

TRIAL EXAMINER: The document handed the reporter will be marked Exhibit 38 for Identification.

[917] (The document referred to was marked Exhibit No. 38 for Identification.)

By MR. GOLDBERG:

Q. What does Exhibit No. 38 show with respect to the amounts of energy transmitted from Holtwood's system in Pennsylvania to the Baltimore-Washington system in Maryland over transmission facilities owned and operated by Holtwood and Susquehanna? A. This exhibit prepared from data furnished me by Holtwood, shows the amounts of electric energy transmitted during each month of the years 1943 and 1944 from the Holtwood System in Pennsylvania to the Baltimore-Washington System in Maryland over the 220 kv and 66 kv transmission circuits.

[918] Q. Mr. Roland, was Exhibit 38—I think you have already stated— A. I beg your pardon?

Q. What does 38 show with respect to the amount of energy transmitted over the Holtwood system in Pennsylvania to the Baltimore-Washington system, and over the other transmission facilities owned and operated by Holtwood; is that what it does show? Is that correct? A. It does show the energy transmitted from Pennsylvania to Maryland, and from Maryland to Pennsylvania. This exhibit was prepared from data furnished me by Holtwood, showing the amount of electric energy transmitted during each month for the years 1943 and 1944 from the Holtwood system in Pennsylvania to the Baltimore-Washington system, and over the 220 kv and 66 kv transmission circuits.

Q. I notice on Exhibit 38, Column/headings, "Meter 5", "Meter 6", "Meter 34"; to what do those numbers refer? A. These numbers identify the meters by reference to a diagram prepared by Holtwood.

When I first requested Holtwood for information regarding energy generation and energy flows at various points on the system, I requested that I be furnished with a diagram showing interconnection points and metering points. In order to simplify the work for the Commission's staff, Holtwood prepared a one-line diagram of the Holtwood-Safe Harbor- [919] Baltimore-Washington transmission system showing thereon the location of certain watt-hour meters. Each of these metering points was given a number. In furnishing the information regarding energy generation and energy transfers, Holtwood identified the point of metering by referring to the numbers shown on the one-line diagram. I have copies of that diagram which carries the Company file Number H-1045.

MR. GOLDBERG: Mr. Examiner, at this point I ask to have marked for identification as Exhibit No. 39 a diagram entitled, "Pennsylvania Water & Power Company, one-line Diagram of Main Metering Points on Holtwood-Safe Harbor-Baltimore-Washington Inter-connected System."

TRIAL EXAMINER: The diagram just handed to the reporter will be marked as Exhibit No. 39 for Identification.

(Exhibit No. 39 was marked for Identification.)

By **MR. GOLDBERG:**

Q. Mr. Roland, is Exhibit 39, which I show you, the one-line diagram to which you have referred in your last answer? **A.** It is.

Q. What does this diagram show? **A.** On this diagram, it will be noted that Meter No. 5 is located at the Safe Harbor Plant and is in the 220 kv circuit extending from Safe Harbor to Ellicott and from there to Westport and to Takoma. It will also be noted [920] that Meter No. 6 is located at the Safe Harbor Plant and is in the circuit extending from Safe Harbor Plant to Riverside. These meters are of the ratchet type and therefore, measure the energy transferred in one direction only, that is, there are two sets of ratchet meters in each circuit, one measuring the send-out over that circuit from Safe Harbor, and the other measuring the amount delivered to the Safe Harbor bus from that circuit. Similar metering equipment is installed in the other 220 kv circuit. Meter No. 34 is located on the low tension side of the Highlandtown Substation. This meter is not of the ratchet type and, therefore, measures the net amount of energy delivered to the Baltimore Company at this point.

Q. What does Exhibit 38 show with respect to the amount of energy transmitted by the Holtwood System from Pennsylvania across the Pennsylvania-Maryland boundary to the Baltimore-Washington System in Maryland over the 220 kv circuits? **A.** During the year 1943, a total of 435,416 mwh, as measured by meters located at Safe Harbor, were transmitted from the 13 kv 60 cycle bus at Safe Harbor to the Baltimore-Washington system in Maryland over the two 220 kv circuits. During the year 1944, 281,610 mwh were so transmitted from Pennsylvania to Maryland.

Q. At what points was the energy transmitted from [921] Pennsylvania to Maryland over the 220 kv circuits, delivered to Baltimore-Washington system? A. The amounts of energy which I stated were transmitted from Pennsylvania to Maryland over the 220 kv circuits were delivered to the Baltimore Company at Riverside and Westport, and to the Washington Company at Takoma Park.

Q. What does Exhibit 38 show with respect to the amount of electric energy transmitted from Maryland to Pennsylvania over the two 220 kv circuits? A. During the year 1943, 127,838 mwh were transmitted over the two 220 kv circuits from Maryland to the 13 kv, 60 cycle bus at Safe Harbor. During the year 1944, 201,075 mwh were transmitted from points in Maryland to Safe Harbor over the two 220 kv circuits.

Q. What does Exhibit 38 show with respect to the amount of energy transmitted from Pennsylvania to the Highlandtown Substation in Baltimore over the 66 kv circuits? A. During the year 1943 a net of 370,806 mwh of electric energy was transmitted by the Holtwood System from Pennsylvania to the Highlandtown Substation over the 66 kv circuits. The energy supplied to the Highlandtown Substation over these circuits is 25 cycle, 3 phase. During the year 1944, a net of 321,206 mwh were transmitted by the Holtwood System from Pennsylvania to the Highlandtown Substation in Maryland over the 66 kv circuits.

[922] Q. Is electric energy also transmitted from the Highlandtown Substation to the Holtwood Hydro Electric Plant over the 66 kv circuits? A. The records which I obtained from Holtwood show that there were times when small amounts of energy were transmitted from the Highlandtown Substation to the Holtwood Substation over the 66 kv circuits. The data indicate, however, that the amounts transmitted from Highlandtown to Holtwood are extremely small in comparison to the amounts transmitted from Holtwood to Highlandtown. I was also informed by

the operators at the Highlandtown Substation that it was very seldom that energy was transmitted from the Highlandtown Substation to Holtwood. An examination of the hourly data furnished by Holtwood at my request for 20 days of 1944 indicates that the amount of energy transmitted from Highlandtown to Holtwood was less than 1 per cent of the amount of energy transmitted from Holtwood to Highlandtown.

Q. Have you attempted to show the amount of electric energy transmitted from Pennsylvania to Maryland and from Maryland to Pennsylvania, over the 220 kv and 66 kv circuits, in graphic form? A. I have.

MR. GOLDBERG: At this time, Mr. Examiner, I ask to have marked for identification the exhibit No. 40, a chart [923] bearing the title, "Electric Energy Transfers Across Maryland-Pennsylvania Boundary over Facilities of Pennsylvania Water & Power Company and Susquehanna Transmission Company of Maryland by Months."

TRIAL EXAMINER: The chart handed the reporter may be marked Exhibit No. 40 for Identification.

(Exhibit No. 40 is marked for Identification.)

. . .

[926] Q. Mr. Roland, at the conclusion of yesterday's session we had just marked Exhibit No. 40 for identification?

A. Yes.

Q. Will you explain what that exhibit shows with respect to transmission of electric energy between Maryland and Pennsylvania by Holtwood and Susquehanna Transmission Company? A. Exhibit 40 shows the amounts of electric energy transmitted from Pennsylvania to Maryland, and from Maryland to Pennsylvania, over each of the 220 kv circuits and over the 66 kv, 25 cycle circuits, during each month of 1943 and 1944. The length of the bar above the zero line is a measure of the amount of electric energy transmitted to Pennsylvania from Mary-

land. The length of the bar below the zero line is a measure of the amount of electric energy transmitted during the month from Pennsylvania to Maryland. The cross-hatched portion of the bars below the line represent net energy transfers over the 66 kv, 25 cycle circuits to Highlandtown. The remainder of the bar represents energy transfers over the two 220 kv circuits. This chart was prepared from data shown in Exhibit 39.

Q. Mr. Roland, am I correct—I think I heard you say that the bar chart was prepared on the basis of the [927] data in Exhibit 39? A. Yes.

Q. Is it not Exhibit 38? A. Well,—

Q. I think it should be. I show you Exhibit 38. A. (Inspecting) It should be Exhibit 38.

Q. Then you amend your answer to read Exhibit 38? A. I do.

Q. What accounts for the substantial variations shown in the amounts transmitted from Maryland to Pennsylvania during 1943 and 1944? A. These variations are primarily the result of variations in the flow of the Susquehanna River.

During the spring months when the river flow is high generation at Safe Harbor and Holtwood Hydro is also high, hence, during these months the flow of energy is predominantly from Pennsylvania to Maryland. During the low-flow period, which usually occurs during the summer and fall the generation at Safe Harbor and at the Holtwood plants is not sufficient to meet the requirements of Holtwood's customers in Pennsylvania, hence, during those periods substantial quantities of steam-generated energy are transmitted from Maryland to Pennsylvania to supplement the output of Safe Harbor and Holtwood plants.

[928] During 1943, the flows in the Susquehanna River were such that the generation at Safe Harbor and Holtwood Hydro was greater than the average by 95,232 mwh. In 1944, the output of Safe Harbor and Holtwood Hydro plants was less than average by 181,386 mwh. This largely

accounts for the relatively greater amounts of energy transmitted from Pennsylvania to Maryland in 1943. It also accounts for the relatively greater amounts of steam generated energy which were transmitted from Maryland to Pennsylvania in 1944.

The amounts of energy transmitted across the Pennsylvania-Maryland boundary over the 220 kv and 66 kv circuits of Holtwood is also affected to some extent by the amounts of economy energy interchanged by Holtwood and its Pennsylvania customers.

MR. GOLDBERG: At this time, Mr. Examiner, I would like to have marked for identification as Exhibit 41 a diagram entitled "Pennsylvania Water & Power Company, Baltimore, Maryland, System and Interconnections Showing Interconnecting Lines for the Various Companies."

TRIAL EXAMINER: The diagram will be marked Exhibit No. 41 for Identification.

(The document referred to was marked Exhibit No. 41 for Identification.)

By MR. GOLDBERG:

Q. Mr. Roland, relating your answer to Exhibit 41, [929] what do your studies show regarding the amounts of electric energy transmitted from the Conestoga Substation to the Pennsylvania Railroad at Conowingo and Perryville over facilities owned and operated by Holtwood and Susquehanna? A. The markings in blue ink on this diagram were made by me after consulting with Mr. Von Eiff, interconnection engineer for Holtwood. This diagram shows four circuits extending from the Conestoga Substation to Perryville. Two of these circuits, designated as P-5 and P-6, because of the switching at Perryville, transmit most of the energy interchanged with Philadelphia Electric Company, at Perryville through the facilities of the Pennsylvania Railroad Company. That is, at times Holtwood supplies energy to Pennsylvania Railroad for rail-

road service north of Perryville which is considered interchange delivery by Holtwood to Philadelphia Electric Company.

At other times, Philadelphia Electric Company supplies energy to Holtwood at Perryville through the facilities of the Pennsylvania Railroad. Such deliveries are considered as interchange deliveries by Philadelphia Electric Company to Holtwood. Some of the energy so delivered by Philadelphia Electric Company is transmitted by Holtwood from Perryville to Conestoga Substation. The balance of the energy received by Holtwood from Philadelphia Electric Company, at Perryville is used for railroad service south of Perryville [930] and, therefore, is considered a delivery by Holtwood to Pennsylvania Railroad for the account of the Baltimore Company.

During 1944, Holtwood delivered 36,527 mwh to the Pennsylvania Railroad at Perryville for the account of the Philadelphia Electric Company, since it was for railroad service north of Perryville. Approximately 30,000 mwh of this amount was transmitted from the Conestoga Substation to Perryville over the circuits designated as P-5 and P-6.

The balance of the energy delivered at this point for the account of the Philadelphia Electric Company was transmitted over the two circuits designated as P-7 and P-8, or from Washington over the Railroad Company's lines.

During 1944, Philadelphia Electric Company delivered to the Holtwood Company at Perryville, a total of 33,388 mwh. About 10,800 mwh of this energy was transmitted from Perryville to Conestoga over the circuits designated as P-5 and P-6. The remainder was supplied to the Railroad Company's facilities south of Perryville, which is considered a delivery by Holtwood to the Railroad Company, for the account of the Baltimore Company.

The two circuits shown on Exhibit 41 and designated as P-7 and P-8 transmit energy from the Conestoga Substation to the Pennsylvania Railroad Company at Fishing

Creek, between Holtwood and Conowingo, and at Conowingo and Perryville. [931] The amounts transmitted over these circuits to the Pennsylvania Railroad Company at Conowingo and Perryville, Maryland, are deliveries to the railroad for the account of the Baltimore Company, that is, sales to the railroad in Maryland, are considered as sales by the Baltimore Company to the railroad.

In 1944, the Holtwood Company transmitted 122,477 mwh to the Railroad Company, at Conowingo and Perryville over circuits P-7 and P-8 for the account of the Baltimore Company.

Data furnished by the Holtwood Company indicates that relatively small amounts of energy were transmitted over circuits P-7 and P-8 from Perryville to the Conestoga Substation.

Q. Mr. Roland, referring to the diagram marked for identification as Exhibit 41, which I show you, am I right in reading that diagram that the two small blue lines below the words "Donegal Tap" are the Donegal Tap? A. Well, the Donegal Tap is right outside of the Safe Harbor Station. On this diagram the Donegal Tap really would be above the blue lettering "Donegal Tap".

Q: Above and to the right, is that correct? A. Yes.

Q. I see. A. The blue lines below the words "Donegal Tap" indicates the interconnection between the facilities of Safe Harbor and Holtwood.

[932] Q. Now, with respect to the amounts of electric energy which Exhibits 38 and 40 show as being transmitted by the Holtwood System from Pennsylvania to the Baltimore-Washington System in Maryland over the 66 kv circuits during the year 1944, where was that energy generated? A. During the year 1944, most of that energy was generated at Holtwood Hydro Plant in Pennsylvania.

Q. How do you determine that? A. The energy delivered by Holtwood to Baltimore Company at Highlandtown over the 66 kv circuits is 25 cycle, 3 phase. The gen-

erators producing that 25 cycle, 3 phase energy are at the Holtwood Hydro Plant.

Q. How much 25 cycle hydro generating capacity is installed at Holtwood hydro? A. There are 8 water turbine driven 25 cycle generating units having an aggregate capacity of 87,000 kilowatts at the Holtwood hydro plant.

Q. What is the principal market for the energy generated by these units? A. Most of the energy generated by these units is delivered to Baltimore Company at Highlandtown.

Q. How much was generated by the 25 cycle units at Holtwood in 1944? A. Generation by the main 25 cycle units at Holtwood totalled about 388,000 mwh in 1944.

[933] Q. What other market is there for 25 cycle energy generated at Holtwood? A. In 1944, Holtwood delivered 30,034 mwh of 25 cycle energy to Pennsylvania Power and Light Company at Lancaster, and during the same year 13,283 mwh of 25 cycle energy were supplied to the 60 cycle system through the two 5,000 kilowatt frequency changers located at Holtwood hydro.

Q. As I understand it, the only outlet for 25 cycle energy generated at Holtwood hydro, other than to Baltimore, is to Pennsylvania Power & Light Company, and to the 60 cycle system through the frequency changer. Is that right? A. Yes.

Q. How much of the 25 cycle energy generated at Holtwood hydro was delivered to Baltimore in 1944? A. A net of 321,206 mwh.

Q. Was the generation and delivery of that energy a part of Holtwood's service to Baltimore? A. Yes.

Q. With respect to the amounts of electric energy which Exhibits 38 and 40 show as being transmitted by the Holtwood system from Pennsylvania to the Baltimore-Washington system in Maryland over the 220 kv circuits during 1944. Where was that energy generated? A. Most of it was generated at the Safe Harbor plant.